



Louisiana Department of Health and Hospitals
Office of Public Health
Center for Environmental Health

Louisiana BEACH Grant Report 2015 Swimming Season

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Prepared by:
Robert Wagner, Ph.D., Quantitative Ecological Services, Inc.
In cooperation with Louisiana Department of Health and Hospitals
Office of Public Health, Center for Environmental Health

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2015 Swimming Season**

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**Louisiana Department of Health and Hospitals
Office of Public Health
Center for Environmental Health
Bienville Building
628 North 4th Street
Baton Rouge, LA 70821-4489**

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Point of Contact

For more information on any portion of this document, please contact:

Mr. Gordon Leblanc
Beach Monitoring Program
Louisiana Department of Health and Hospitals, Office of Public Health
Bienville Building
628 N. 4th Street
P. O. Box 4489
Baton Rouge, La. 70821-4489

Phone: (225) 342-7617

Table of Contents

EXECUTIVE SUMMARY	7
CHAPTER 1. Purpose, Background and 2015 Program Accomplishments	9
Purpose.....	9
Background	9
Program Accomplishments During 2015.....	10
CHAPTER 2 - Update Of BEACH Program	11
Review of Beach Rankings	11
Program Modifications	16
CHAPTER 3. Louisiana BEACH Program’s 2015 Results	18
Number of Samples Collected	18
Summary Statistics for 2015 Designated Monitoring Period Samples.....	19
Time-Series of 2015 Designated Monitoring Period Samples	23
Weekly Decision Rule Outcomes	24
Relationship between Indicator Organisms and Environmental Conditions	26
CHAPTER 4. Evaluation of Program Performance Relative to Data Quality Objectives. .29	
REFERENCES.....	33
APPENDIX A	34
APPENDIX B	36
APPENDIX C	49
APPENDIX D	75

List of Tables

Table 1. Continuous beach segments, beach miles, monitoring Tier assignments for 2015 and 2016, and sample stations.	13
Table 2. Number of continuous beach segments, sample stations, and beach miles monitored by Tier during 2016 and planned for 2016.	14
Table 3. Beach water quality and use risk categories for 2016 swimming season based on anticipated use in 2016 and 2015 water quality data.	15
Table 4. Combined beach use and water quality risk categories for 2016.	16
Table 5. Total number of samples collected by sample station and sample type during 2015 by Louisiana’s BEACH Program.....	18
Table 6. Number of independent samples collected by sample station during the 2015 monitoring season (1 April – 31 October). Samples collected at the same station on the same day are counted as a single sample.	20
Table 7. Summary statistics for enterococci density (MPN/100ml), and salinity for samples collected during the 2015 designated monitoring season by sample station.	21
Table 8. Advisory history by sample station and week for beach segments designated and monitored as either Tier 1 or Tier 2 beaches during the 2015 swimming season.	25
Table 9. Summary of 2015 advisories and closures.	26
Table 10. Summary of weekly decision rule exceedances by cause for 2015.	26
Table 11. Data quality objectives and 2015 results.	29

List of Figures

- Figure 1. The distribution of \log_e transformed enterococci densities (MPN/100ml) by sample station relative to the geometric mean criterion for samples collected during the 2015 designated monitoring season. The box represents the inner quartile range (25th to 75th percentiles), and upper and lower whiskers extending from the box represent the smallest and largest observations within one step (1.5 times inner quartile range). The median (\diamond) is marked by a line through the box, and horizontal bars (—) represent extreme values. 22
- Figure 2. The distribution of salinity (ppt) by sample station for samples collected during the 2015 designated monitoring season. 23
- Figure 3. Distribution of \log_e enterococci densities by year within continuous beach segments relative to geometric mean criterion (red dashed lines) and single sample maximum criterion (blue dotted lines). 28
- Figure 4. Comparison of 2015 monitoring season mean enterococci relative percent difference (RPD) for field duplicates and field splits with QAPP precision goals. Means are represented by diamonds and upper and lower 95th percentiles of the mean are shown as error bars. 30
- Figure 5. Comparison of 2015 monitoring season mean salinity relative percent difference (RPD) for field duplicates and field splits with QAPP precision goals. Means are represented by diamonds and upper and lower 95th percentiles of the mean are shown as error bars. 31

EXECUTIVE SUMMARY

This document was prepared to partially fulfill the Louisiana Department of Health and Hospitals, Office of Public Health, Center for Environmental Health Services (CEHS) reporting obligations under U.S. Environmental Protection Agencies (USEPA) BEACH grant program, Federal Assistance Agreement Number CU-00F85201-0. Prior to publication of this report, the document was distributed to USEPA and the Louisiana Department of Environmental Quality for comments. The comments provided by both agencies were incorporated into this report. The report was made available to the public through CEHS's Beach Monitoring Program website (<http://new.dhh.louisiana.gov/index.cfm/page/288>).

As documented in *Louisiana's BEACH Grant Final Report – Grant Year 2001* (LDHH 2003; the Beach Report) and *Louisiana's Beach Program Quality Assurance Project Plan* (QAPP; LDHH 2015), CEHS is to submit an annual technical report to USEPA after the end of the recreational period that summarizes the number of beaches monitored in each Tier, lists any additional beaches to be added to the Program or Tier reassignments to be made in the next year, presents a compilation of sampling results, and summarizes assessment activities and response actions. The report is to also include for Tier 1 and 2 beaches, the number of beach monitoring stations for which advisories were issued, the number of times beach monitoring criteria were exceeded and the number of days under advisories for each beach monitoring station. This report satisfies the reporting obligations set forth in the Beach Report and outlined above.

Beach use during 2015 was comparable to that of recent years. Hackberry Beach (HACK1) in Cameron Parish, rendered inaccessible due to road damage by Hurricane Ike in 2008, remained inaccessible through the 2015 swim season. Public access to Fourchon Beach continued to be restricted during 2015 by a dispute over land ownership, with the ostensible private landowner denying public access to the beach area beyond the end of the public road. Accordingly, there was no public use of Fourchon Beach in 2015 and the beach was not monitored.

Between 1 April 2015 and 31 October 2015, a total of 772 samples were collected at 24 sample stations across 10 Tier 1 or 2 continuous beach segments. Monitoring was initiated and conducted on schedule from the start of the monitoring season (1 April) through the end of the season (31 October). Enterococci density during 2015 was greater than during 2014 at all beach segments except Constance Beach Complex, Elmer's Island, and Grand Isle State Park, which remained relatively stable between 2014 and 2015, and Fontainebleau State Park, which had lower enterococci density during 2015.

Sixty-five (65) advisories were issued at 22 of the 24 Tier 1 or 2 sample stations during 2015 based on observed water quality exceedances. There were no advisories issued at Grand Isle Beach 1 (GIB1) and Grand Isle State Park 1 (GISP1). Compliance at stations with advisories varied between 95% of monitored days in compliance at GISP4, to a low of 30% for RUTH1. Across all monitored sample stations, 70% (3,093 of 4,392) of the 2015 swimming season's station-days were in compliance and not under an advisory.

Advisories issued in 2015 resulted from exceedances of enterococci geometric mean and single sample maximum criteria. The enterococci GM was exceeded in 196 of 225 (87%) observed

noncompliance weeks, with 117 (52%) of those noncompliance weeks resulting from enterococci geometric mean exceedances only, 79 (35%) resulting from both enterococci geometric mean and single sample maximum exceedances, and 29 (13%) resulted from exceedance of enterococci single sample maximum criterion alone. As discussed in previous Louisiana BEACH Grant reports, Louisiana's percentage of monitored station-weeks that were in compliance is not directly comparable with other states that do not use equivalent decision criteria. If Louisiana's decision rule was based only on the enterococci single sample maximum criterion, the State would have had 52% fewer noncompliance weeks during 2015.

Based on year-end audit and data review, all completeness goals were achieved, and there were no variances from the QAPP detected. Of the 772 samples successfully processed, all results were considered valid and recorded in the Program's database. All monitoring and notification data collected during 2015 have been uploaded to the appropriate USEPA data storage systems (available through STORET [<http://www.epa.gov/storet/>] and BEACON [<http://watersgeo.epa.gov/beacon2/about.html>]).

In preparation for the 2016 Beach monitoring season, the Program reassessed risk levels at monitored beaches to determine whether or not any additional beaches warranted monitoring. Risk is a function of historical water quality conditions based on past Program sampling and beach use. Based on observed use levels and patterns during the 2015 swimming season and projections of use for the 2016 swimming season, it is anticipated that use levels and patterns will remain at approximately historical levels for all beaches except for the Hackberry and Fourchon Beaches. Hackberry Beach use is expected to remain limited during 2016 due to the continuing absence of adequate road access. Public access to Fourchon Beach is expected to remain restricted until the landownership dispute that restricted access during 2011-2015 is resolved or other arrangements to restore public access are negotiated. No additional beach segments were identified that warranted monitoring in 2016.

The anticipated use and historical water quality risk levels resulted in the 2016 monitoring season classification of seven continuous beach segments as Tier 1 beaches (Fontainebleau state Park, Elmer's Island [ELMR], Grand Isle and Cypremort Point State Parks, Holly [HOLLY], and North and South Beaches), three beach segments as Tier 2 (Grand Isle Beach, the Constance Beach Complex, and Hackberry and Rutherford Beaches), and three Tier 3 beach segments (Fourchon, Fourchon-West, and Elmer's Island East). As in 2015, the Fourchon beach segments (FOUR1–FOUR3 and FOUR4) have been assigned to Tier 3 due to public access restrictions and will not be monitored in 2016. In 2016, it is anticipated that the Program will monitor 6.0 beach miles as Tier 1 beaches, 14.0 miles as Tier 2 beaches, and 0 miles of Tier 3 beach.

CHAPTER 1. Purpose, Background and 2015 Program Accomplishments

Purpose

According to *Louisiana’s BEACH Grant Final Report – Grant Year 2001* (the Beach Report; LDHH 2003) and *Louisiana’s Beach Program Quality Assurance Project Plan* (QAPP; LDHH 2015), the Louisiana Department of Health and Hospitals (LDHH), Office of Public Health (OPH), Center for Environmental Health Services (CEHS) is to submit an annual technical report to U.S. Environmental Protection Agency (USEPA) after the end of the recreational period. The report should accomplish the following: summarize the number of beaches monitored in each Tier, list any additional beaches to be added to the Program or Tier reassignments to be made in the coming year, provide a compilation of the sampling results, and summarize assessment activities and response actions. This report serves as the annual technical report for the 2015 recreational period and satisfies all of the requirements described above.

This document consists of four chapters. In this chapter, 2015 Program accomplishments are summarized. Chapter 2 contains a summary of the number of beaches that were monitored in each Tier, and a description of updates to Louisiana’s BEACH Program, as anticipated under the Beach Report. Louisiana’s BEACH Program updates include descriptions of 2015 Program modifications and changes to Tier assignments and beaches to be monitored under the Program in 2016. In Chapter 3, monitoring and response efforts and results for 2015 are provided. Data quality assessment results for the 2015 swimming season are presented in Chapter 4. Appendices A, B, and C contain station names and USEPA IDs, time series analyses of water quality data, and sample results, respectively. Appendix D provides a summary of how Louisiana’s BEACH Program has fulfilled the original BEACH Grant requirements.

Background

In many ways, water could be considered Louisiana’s greatest natural resource. Louisiana’s vast estuarine basins provide a unique playground for swimming, wading, boating, fishing, and other aquatic activities. However, swimming in waters with high bacteria densities from fecal sources are a known threat to public health, causing elevated rates of gastrointestinal illness. LDEQ has historically conducted routine ambient monitoring of state coastal waters designated for primary contact recreation and utilized fecal coliform criteria to assess attainment of ambient water quality standards for swimming uses. However, there were no mechanisms in place to routinely sample water quality at “high-use” swimming waters, which had not been designated in state regulations by LDEQ, or to provide the public with the results of risk-based analyses that allow for an informed decision prior to swimming in selected coastal recreation waters.

In response to growing concern about public health risks posed by polluted bathing beaches, the U.S. Congress passed the BEACH Act in 2000. In 2001, the USEPA, under the provisions of the BEACH Act, made grant funds available to the OPH for the development of a monitoring and notification program for high-use coastal recreation sites, referred to as Louisiana’s BEACH Program. Since initial grants were awarded, Louisiana’s BEACH Program has been developed and successfully implemented under the guidance of the CEHS.

Consistent with USEPA’s guidance, Louisiana’s BEACH Program consists of two primary activities: monitoring and notification. Since bacteriological contaminants cannot be effectively monitored directly, monitoring for fecal contamination of surface waters requires the identification of indicator organisms that are associated with fecal contamination and readily monitored using available technologies. Like most other states, Louisiana historically used fecal coliform densities as the indicator of bacteriological contamination of surface waters. However, under the terms of BEACH grant awards, states are required to base decisions about marine water quality at sites monitored using BEACH grant funds on enterococci bacteria densities. Enterococci have recently become generally accepted by the scientific community as more closely associated with rates of gastrointestinal illness in marine environments than fecal coliform densities, and thus USEPA believes that the use of enterococci may serve to better protect the public health in marine environments.

The second primary activity under the Program is public notification. Louisiana’s BEACH Program issues public health advisories at Tier 1 and 2 monitored sites (tiers are defined in Chapter 2) when water quality samples are found to exceed the enterococci criteria. The enterococci criteria used are a single sample maximum of 104 and a steady state maximum based on a 30-day running geometric mean of 35 (quantities expressed as MPN/100 ml). Advisories urge users to abstain from swimming, but do not officially “close” the water body to recreational use. The Program disseminates swim advisories by press release, website postings, and by opening pole-mounted signs which are installed at the beach monitoring sites. When water quality sample results indicate that bacteria levels at beach sites under swim advisories are once again compliant with the decision rule, the public is notified that the advisory has been lifted through beach signage, press releases, and the website (<http://new.dhh.louisiana.gov/index.cfm/page/288>).

Program Accomplishments During 2015

During 2015, Hackberry Beach remained inaccessible due to prior hurricane related road damage, and access constraints due to an ownership dispute and beach construction activities on Fourchon Beach continued to restrict public access to the beach area. Accordingly, HACK1 and FOUR1–FOUR4 were not monitored during 2015.

During 2015, Louisiana’s BEACH Program:

1. Monitored all accessible sample sites designated for monitoring in accordance with the requirements of their tier assignment throughout the swimming season; and
2. Continued to meet or exceed the quality assurance/quality control goals established in the Program’s QAPP (LDHH 2015).

CHAPTER 2 - Update Of BEACH Program

Review of Beach Rankings

In 2003, the CEHS completed a systematic process to identify and rank Louisiana's beaches according to risk. The process consisted of the following steps (LDHH 2003):

1. Identification and definition of coastal recreation waters;
2. Identification of beaches or similar points of access used by the public for swimming, bathing, surfing, or similar water contact activities;
3. Review of available information on levels of potential fecal contamination at beaches and intensity of beach use; and
4. Ranking of beaches to decide which beaches would be included in Louisiana's BEACH Program.

Based on levels of beach use and perceptions of water quality from estimated fecal coliform densities in adjacent waters, a qualitative ranking scheme was devised and used to assign each beach to an appropriate monitoring tier. The monitoring tiers provide different levels of monitoring and public notification so that beaches with a greater density of swimmers, and thus the greatest number of people at risk, receive higher levels of monitoring and public notification than lower use beaches. Monitoring and public notification procedures are exactly the same at Tier 1 and Tier 2 beaches, but differ in density of sample stations. Sample stations are closer together at Tier 1 beaches, no more than 500 meters apart, than at Tier 2 beaches, where samples stations are no more than 2 miles apart on continuous beach segments. Sample stations at Tier 3 beaches are at the same density as Tier 2 beaches, but samples are not collected weekly, and accordingly, weekly public advisories are not issued for Tier 3 beaches.

The estimated number of swimmers at each beach was based on information obtained primarily from law enforcement officials responsible for patrolling the beach and from park managers. The officials provided estimates of the number of beach visitors on a typical weekday, weekend, and holiday during the peak swimming season, May 1 through Labor Day, along with an estimate of the percentage of beach users entering the water. These estimates were combined by adding typical weekday and weekend use to provide an estimate of weekly use. Weekly use was multiplied by the number of weeks in the recreational period, and added to the estimated number of holiday visitors during Memorial Day, Fourth of July, Labor Day, and any other beach-specific major events. Because the resulting total was an estimate of unknown precision, those estimates were generalized into broad categories of use for relative comparison as follows:

Category of Use	Estimated Number of Swimmers
Very Low	<5,000
Low	5,000 to <10,000
Moderate	10,000 to <15,000
High	15,000 to 20,000
Very High	>20,000

Because beach water quality was either inferred from the water quality of the surrounding area as a whole, or based on a short period of data, and no studies were available providing a model of the relationship between fecal coliform concentrations and illness rates, the qualitative ranking process relied primarily on beach use. Beaches classified as having very high, high, or moderate to high use were assigned to Tier 1 and receive the most monitoring attention. Beaches classified as having moderate use were assigned to Tier 2. Beaches with low or very low use were assigned to Tier 3 and targeted for additional bacterial indicator monitoring to better characterize risk. Beaches on private land or with existing swimming advisories posted by the State, and with very low public use were excluded from further consideration. A total of 29.16 miles of beach were considered for monitoring under Louisiana's BEACH Program, of which 23 miles have been assigned to a monitoring tier (LDHH 2003).

CEHS anticipated that beach use and water quality could change through time, and planned to re-evaluate beach rankings on an annual basis at the end of each swimming season (LDHH 2003). In 2006, it was decided that the Program would continue to evaluate risk primarily on the estimated density of swimmers at a beach in accordance with the original categories of use described above, but a new method of assessing water quality risk was developed. The original assessment evaluated water quality based on estimated fecal coliform densities, which was the only beach specific indicator organism data available at the time. Data collected during 2004 and 2005 provided new information about water quality, including enterococci densities, which were not previously available. Because USEPA's chosen indicator organism for marine waters is enterococci, and because greater than 99.8% of all of Louisiana's swim advisories issued through 2005 involved exceedance of enterococci criteria, new water quality categories based on enterococci densities were developed for use in the risk-based Tier assignment process (LDHH 2006).

A sample station's enterococci geometric mean density was strongly correlated with the percentage of monitored weeks under advisory, so a sample station's geometric mean is a good indicator of the likelihood of exceeding the established limits of acceptable risk. Accordingly, water quality risk categories were based on the ratio of a beach's enterococci geometric mean divided by the enterococci geometric mean decision criterion of 35 MPN/100 ml. Water quality risk categories were established as: "Lower Risk" if the beach's geometric mean/35 < 0.5; "Moderate Risk" if the beach's geometric mean/35 \geq 0.5 and < 1; and "Higher Risk" if the beach's geometric mean/35 \geq 1. Using the revised classification scheme, continuous beach segments were assigned to Tiers at the beginning of 2015. Table 1 identifies the beaches that were monitored under the Program during 2015, their designated 2015 monitoring Tier, and associated sample stations.

Beach use during 2015 approximates historical levels with two exceptions. Hackberry Beach (HACK1) in Cameron Parish, rendered inaccessible due to road damage by Hurricane Ike in 2008, remained inaccessible through the 2015 swim season. Public access to Fourchon Beach continued to be restricted during 2015 by a dispute over land ownership, with the ostensible private landowner denying public access to the beach area beyond the end of the public road. Accordingly, there was no public use of Fourchon Beach in 2015.

Table 1. Continuous beach segments, beach miles, monitoring Tier assignments for 2015 and 2016, and sample stations.

Continuous Beach Segments	Designated Beach Miles	First Year Sampled	2015 Designated Monitoring Tier	2015 Actual Monitoring Tier	2016 Designated Monitoring Tier	Sample Station State IDs*
Lake Pontchartrain Basin Beaches						
Fontainebleau State Park	0.13	2004	1	1	1	FONT1
Barataria River Basin Beaches						
Elmer's Island	0.31	2012	1	1	1	ELMR1
Elmer's Island-East	1.92	2012	3	3	3	ELMR2
Grand Isle State Park	1.03	2004	1	1	1	GISP1-4
Grand Isle Beach	6.20	2005	2	2	2	GIB1-3
Fourchon	0.88	2005	3	3	3	FOUR1-3
Fourchon-West	1.59	2005	3	3	3	FOUR4
Vermilion-Teche River Basin Beaches						
Cypremort Point State Park	0.47	2004	1	1	1	CYPT1
Calcasieu River Basin - Lake Charles Beaches						
North Beach - Lake Charles	0.42	2009	1	1	1	LCNB1
South Beach & Rabbit Island	0.23	2009	1	1	1	LCSB1
Calcasieu River Basin - Cameron Beaches						
Holly Beach	3.44	2005	1	1	1	HOLLY1-6
Mermentau River Basin Beaches						
Hackberry Beach and Rutherford Beach	2.40	2005	2	2	2	HACK1, RUTH1
Sabine River Basin Beaches						
Constance Beach Complex (CNSTBC)	6.29	2005	2	2	2	CNST1, DUNG1, GBRZ1, LTFL1, MART1

Note: * Sample station names and USEPA IDs are provided in Appendix A.

During 2015, seven continuous beach segments were designated as Tier 1 beaches and scheduled for monitoring (Grand Isle, Cypremort Point, and Fontainebleau State Parks; Elmer's Island, Holly Beach, and North and South Beaches in Lake Charles), and three continuous beach segments were designated as Tier 2 (Grand Isle Beach, Hackberry and Rutherford Beaches, and the Constance Beach Complex). Fourchon and Fourchon-West were scheduled to be monitored as Tier 3 beaches. All beach segments were monitored at their designated tier level during 2015 except for Fourchon, Fourchon-West and Hackberry Beaches. Sample stations FOUR1-FOUR4 and HACK1 were not monitored as scheduled due to access constraints described above. Elmer's Island East was not scheduled to be monitored during 2015 due to very-low usage and lower risk water quality.

In summary, during 2015, the Program monitored all 6.0 Tier 1 beach miles at the seven continuous Tier 1 beach segments, including sampling and public notification at all 15 of the Tier 1 sample stations (Table 2). Three continuous beach segments totaling 14.9 miles were

designated as Tier 2 beaches, of which 14.0 miles were monitored including sampling and public notification at 9 of the 10 sample stations (HACK1 was not monitored due to ongoing access constraints). Four Tier 3 sample stations on Fourchon (FOUR1-FOUR3) and Fourchon-West (FOUR4) were not monitored in 2015 due to access constraints, and Elmer's Island East (ELMR2) was not scheduled to be monitored resulting in 0 of 4.4 Tier 3 beach miles monitored.

Table 2. Number of continuous beach segments, sample stations, and beach miles monitored by Tier during 2016 and planned for 2016.

	2015 (Actual)			2016 (Projected)		
	Tier 1	Tier 2	Tier 3	Tier 1	Tier 2	Tier 3
Number of Continuous Beach Segments	7	3	3	7	3	3
Number of Sample Stations	15	10	5	15	10	5
Total Beach Miles	6.0	14.9	4.4	6.0	14.9	4.4
Number of Continuous Beach Segments Monitored	7	3	0	7	3	0
Number of Sample Stations Monitored	15	9	0	15	9	0
Total Beach Miles Monitored	6.0	14.0	0	6.0	14.0	0

In anticipation of the 2016 swimming season, as in past years, monitoring tier assignments were reviewed for all beaches based on expected use levels and historical water quality. It is anticipated that use levels and patterns will remain at approximately historical levels for all beaches except for the Hackberry and Fourchon beaches. Public access to the Fourchon and Fourchon-West beach segments is expected to remain restricted until the landownership issue is resolved or other arrangements to restore public access are negotiated.

Using water quality data pooled across sample stations within continuous beach segments, water quality risk categories were calculated for each continuous beach segment for use in establishing 2016 Tier assignments (Table 3). Two systems of water quality assessment were used, the Louisiana BEACH Program's beach risk classification, as described above, and the World Health Organization's (WHO) risk categorization system. The WHO's microbial water quality assessment criterion (WHO 2003) was applied to the last three years (2013–2015) of Louisiana's water quality data. In addition to water quality, the WHO classification system uses sanitary inspection categories to classify waters from very good to very poor, depending on the beach's susceptibility to fecal influence as determined by a sanitary survey, but only the microbial criterion was evaluated for the purposes of this report. Rather than rely on the annual enterococci geometric mean for its microbial criterion, the WHO uses the 95th percentile of observed enterococci densities over a longer term period, typically a minimum of three years, because it is easily understood and reflects much of the top-end variability in the distribution of water quality data that are of greatest public health concern and is robust against periodic variation in water quality. The WHO classifies water quality into four categories based on enterococci density (cfu/100 ml) and the associated risk of acquiring gastrointestinal illness as follows: A) <1 case in 100 exposures, 95th percentile ≤40 cfu/100 ml; B) between 1 and 5 cases in 100 exposures, 95th percentile 41-200 cfu/100 ml; C) between 5 and 10 cases in 100 exposures, 95th percentile 201-500 cfu/100 ml; and D) >10 cases in 100 exposures, 95th percentile >500 cfu/100 ml. For comparison, the USEPA's gastrointestinal illness rate

associated with the 1986 recommended enterococci criteria for marine recreational waters is 19 illnesses per 1,000 swimmers and the 2012 recommended enterococci criteria is 32-36 gastro intestinal illnesses per 1,000 swimmers, both of which falls within WHO category B. To facilitate comparison with Louisiana's risk categories, we have categorized WHO classes A and B as lower risk, C as moderate, and D as higher risk.

Table 3. Beach water quality and use risk categories for 2016 swimming season based on anticipated use in 2016 and 2015 water quality data.

Beach	Anticipated 2015 Use	2015 Entero. Geometric Mean	2015 Entero. Geometric Mean / 35	2015 Water Quality Risk Cat.	Entero. 95 th Parametric Percentile 2013-2015	WHO Risk Category
CNSTBC	Low	22.9	65%	Moderate	208	C
CYPT	Mod.-High	48.6	139%	Higher	385	C
ELMR	High	14.6	42%	Lower	96	B
FNTB	High	35.3	101%	Higher	291	C
FOUR ¹	Very Low	33.3	95%	Moderate	89	B
GIB	Moderate	17.3	49%	Lower	71	B
GISP	Very High	14.8	42%	Lower	131	B
HACK-RUTH	Very Low	73.8	211%	Higher	438	C
HOLLY	Mod.-High	33.4	96%	Moderate	266	C
LCNB	Very High	36.8	105%	Higher	277	C
LCSB	Very High	68.2	195%	Higher	405	C

Notes: ¹ During 2015, Fourchon Beaches were not sampled; accordingly, 2013 results are presented.

Water quality calculated using the Louisiana and the WHO risk categorization systems typically agrees closely. However, differences between the two categorization schemes can result from using different time periods (Louisiana's risk categorization uses only the prior year, where the WHO uses three years), and metrics (geometric mean versus 95th percentile). Using the modified WHO risk categorization results, four continuous beach segments were classified in the lower water quality risk category (Elmer's Island, Fourchon and Grand Isle beaches, and Grand Isle State Park), and seven in the moderate risk category (Constance Beach Complex, Cypremort Point and Fontainebleau State Parks, Hackberry and Rutherford Beaches, Holly Beach, and North and South Beaches in Lake Charles). In contrast with the modified WHO categorization, Louisiana's risk categorization resulted in three continuous beach segments classified in the lower water quality risk category (Elmer's Island, Grand Isle Beach and State Park), three in the moderate category (Constance Beach Complex, Fourchon, and Holly Beach), and five in higher category (Cypremort Point and Fontainebleau State Parks, Hackberry-Rutherford Beach, and North and South Beaches in Lake Charles).

Combined 2015 use and water quality rankings for each continuous beach segment are given in Table 4. As discussed above, tier categories remain based on the same swimmer density categories that were used in the original tier designation system, but low and very low use categories are designated as "Discretionary." For "Discretionary" beach segments, the Louisiana

Water Quality Risk ¹ =>						
		Lower Risk	Moderate Risk	Higher Risk	Unknown	
▲ # of Swimmers	VH	GISP		LCNB, LCSB		Tier 1
	H	ELMR1	HOLLY	CYPT, FNTB		
	M	GIB				Tier 2
	L		CNSTBC ²			Tier3
	VL	ELMR2 ³	FOUR1-FOUR3, & FOUR4 ⁴	HACK-RUTH ⁵		
		Discretionary				

enterococci is greater than 104 MPN/100 mL (75th percentile of a log-normal distribution with geometric mean = 35 and log₁₀ st. dev. = 0.7). Exceedance of either criterion results in the beach being classified as “out of compliance” and an advisory issued. These criteria will continue to be used in 2016.

No other modifications were made to the Program’s procedures, methods or decision rule during 2015. The Program followed the procedures, methods and decision rule summarized in *Louisiana’s BEACH Program Quality Assurance Project Plan, Version 3*, which is available on the World Wide Web at <http://new.dhh.louisiana.gov/index.cfm/page/288>.

CHAPTER 3. Louisiana BEACH Program's 2015 Results

Number of Samples Collected

Between 1 April 2015 and 31 October 2015, a total of 772 samples were collected at 24 sample stations (see Table 5), distributed among four sample types: field duplicates and splits, resample, and routine samples. Each type of sampling is described below.

Table 5. Total number of samples collected by sample station and sample type during 2015 by Louisiana's BEACH Program.

Sample Station	Sample Type				Station Total
	Field Duplicate	Field Split	Resample	Routine	
CNST1	1	2	0	29	32
CYPT1	1	1	0	29	31
DUNG1	2	2	0	29	33
ELMR1	3	0	0	28	31
FNTB1	1	2	0	30	33
GBRZ1	2	1	0	29	32
GIB1	2	0	0	28	30
GIB2	1	3	0	29	33
GIB3	1	2	0	29	32
GISP1	5	2	0	29	36
GISP2	2	2	0	29	33
GISP3	1	2	0	29	32
GISP4	2	2	0	29	33
HOLLY1	2	2	0	29	33
HOLLY2	3	1	0	29	33
HOLLY3	2	1	0	29	32
HOLLY4	1	2	0	29	32
HOLLY5	1	0	0	29	30
HOLLY6	1	1	0	29	31
LCNB1	0	1	0	29	30
LCSB1	4	3	0	29	36
LTFL1	0	1	0	29	30
MART1	2	4	0	29	35
RUTH1	0	0	0	29	29
Sample Type Total	40	37	0	695	772

Routine samples are the regularly scheduled weekly samples collected during the designated monitoring period at beaches that are officially part of the Program. A total of 695 routine samples were collected across 24 sample locations monitored in 2015. Resamples are collected at the BEACH Program Manager's discretion when a routine sample has an unexpectedly high indicator organism density or when the source of an exceedance is known and has been corrected and extra samples are required to calculate a post-event geometric mean. There were no resamples collected during 2015.

Field duplicates and field splits are two types of quality control (QC) samples. Field duplicates were used to estimate the precision of sampling methods by comparing laboratory results for two samples taken consecutively on the same day at the same sampling site (i.e., one grab is considered the routine sample or resample and the other the QC sample). Field splits were used to estimate the precision of laboratory analyses (intra-laboratory) plus any variability induced during sample handling and transport by analyzing two aliquots of the same water sample (i.e., one-half of the split sample is considered the routine sample or resample and the other half the QC sample), which were subdivided in the field. Louisiana's BEACH Program QAPP requires that approximately 10% of scheduled sample events be designated as quality control samples, which are selected at random at the beginning of the sampling period in approximately equal proportions ($\approx 5\%$ each) of field duplicate and field split samples. QC samples may also be collected during resample events to improve the precision of estimated indicator organism densities by averaging resample and QC sample results. A total of 81 QC samples were scheduled to be collected concurrent with the 720 routine samples, and were to consist of 43 field duplicates and 38 field split samples. Of the 720 scheduled routine samples, 695 were collected (96.5%), with 15 station-weeks missed due to delaying sampling until the second week of April for 15 sample stations, which still allowed collection of four samples prior to the start of the swimming season. The remaining 10 missed samples resulted from 8 missed due to a sample handling error, 1 due to construction closing the road to ELMR1, and due to lab error. For the stations-weeks with sample results, 79 QC samples were scheduled (42 field duplicates and 37 field split samples). A total of 40 field duplicates and 37 field split samples were collected during 2015. Forty (40) field duplicates were sampled as scheduled (95%), and 36 field split samples were collected as scheduled (97%), resulting in 96% of scheduled QC samples collected. One scheduled field duplicate was collected as a field split.

Of the 772 total samples, all were collected during the designated monitoring period, and those collected at Tier 1 and 2 beaches were used to make weekly water quality decisions. For analysis purposes, samples collected on the same date at the same location were not considered independent, and were averaged together (i.e., arithmetic mean) resulting in a total of 695 independent samples collected during the 2015 designated monitoring season (see Table 6).

Summary Statistics for 2015 Designated Monitoring Period Samples

Results of enterococci density (MPN/100ml) and salinity (parts per thousand; ppt) for each sample location during the 2015 designated monitoring period are summarized in Table 7, and those summaries are depicted graphically in Figures 1 and 2. Because indicator organism densities are lognormal distributed, Table 7 presents \log_e mean and \log_e standard deviations;

exponentiation of the \log_e mean produces the geometric mean on the nominal scale. Note that the \log_e enterococci median shown in the graph and \log_e mean in Table 7 are approximately equal as would be expected for lognormal distributed populations.

Figures 1 shows the distribution of \log_e enterococci densities (MPN/100ml) by sample station relative to the decision criteria for samples collected during the 2015 designated monitoring season. Salinity by sample station is shown in Figure 2.

Table 6. Number of independent samples collected by sample station during the 2015 monitoring season (1 April – 31 October). Samples collected at the same station on the same day are counted as a single sample.

Sample Station	Number of Samples
CNST1	29
CYPT1	29
DUNG1	29
ELMR1	28
FNTB1	30
GBRZ1	29
GIB1	28
GIB2	29
GIB3	29
GISP1	29
GISP2	29
GISP3	29
GISP4	29
HOLLY1	29
HOLLY2	29
HOLLY3	29
HOLLY4	29
HOLLY5	29
HOLLY6	29
LCNB1	29
LCSB1	29
LTFL1	29
MART1	29
RUTH1	29
Totals	695

Table 7. Summary statistics for enterococci density (MPN/100ml), and salinity for samples collected during the 2015 designated monitoring season by sample station.

State ID	Enterococci			Salinity (ppt)		n
	Geo. Mean	Log _e Mean	Log _e St. Dev.	Mean	St. Dev	
CNST1	23.9	3.17	1.44	24.0	6.96	29
CYPT1	48.6	3.88	1.58	5.0	4.79	29
DUNG1	20.9	3.04	1.20	24.2	6.90	29
ELMR1	14.6	2.68	1.03	22.2	6.90	28
FNTB1	35.3	3.56	1.73	2.1	1.51	30
GBRZ1	30.3	3.41	1.18	24.0	6.94	29
GIB1	16.3	2.79	0.94	21.0	8.27	28
GIB2	17.1	2.84	1.50	21.0	8.16	29
GIB3	18.5	2.92	1.23	21.2	7.85	29
GISP1	10.5	2.35	0.83	19.3	8.46	29
GISP2	15.8	2.76	1.16	19.8	8.64	29
GISP3	20.0	3.00	1.39	20.0	8.52	29
GISP4	14.2	2.65	1.21	20.1	8.48	29
HOLLY1	33.7	3.52	1.37	23.3	7.51	29
HOLLY2	33.0	3.50	1.54	23.3	7.45	29
HOLLY3	34.0	3.53	1.41	23.3	7.42	29
HOLLY4	36.4	3.59	1.51	23.3	7.43	29
HOLLY5	27.8	3.33	1.41	23.3	7.39	29
HOLLY6	36.6	3.60	1.52	23.3	7.36	29
LCNB1	36.8	3.61	1.61	6.2	6.34	29
LCSB1	68.2	4.22	1.65	8.6	7.31	29
LTFL1	22.9	3.13	1.35	24.0	6.95	29
MART1	18.3	2.91	1.28	24.3	6.77	29
RUTH1	73.8	4.30	1.20	21.5	8.91	29

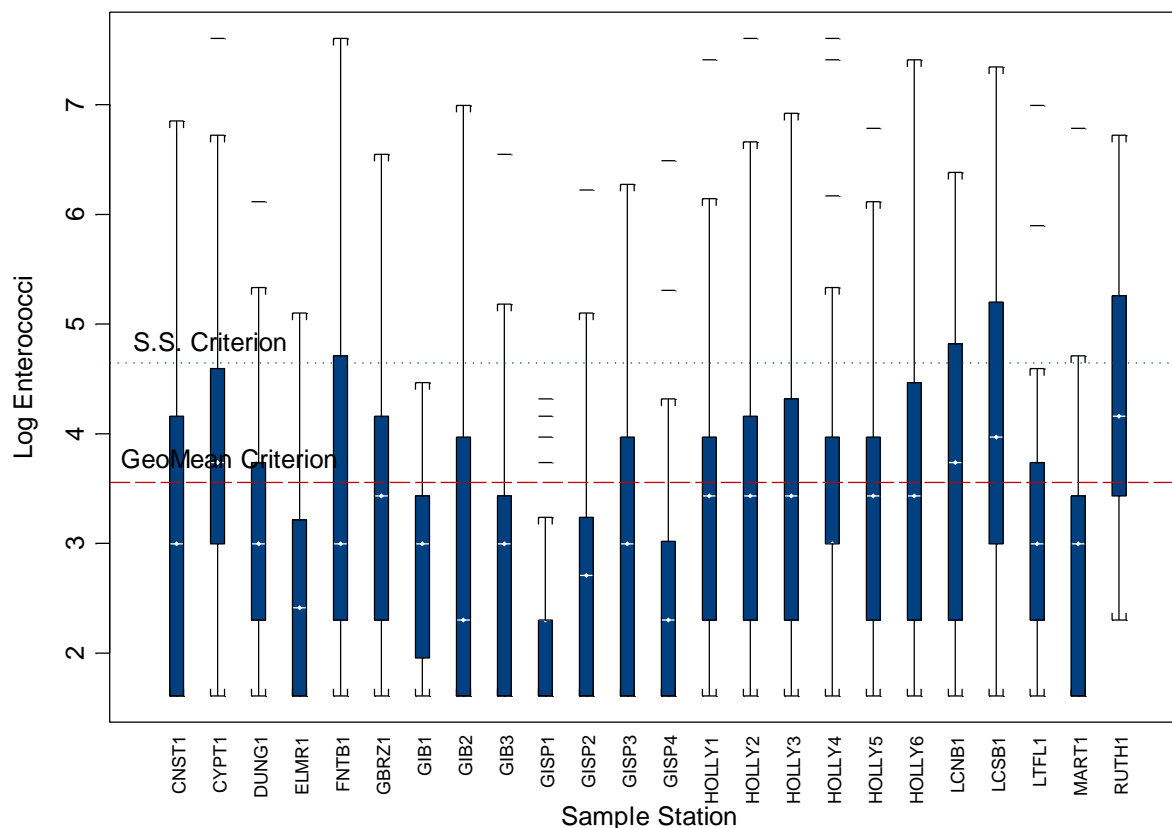


Figure 1. The distribution of \log_e transformed enterococci densities (MPN/100ml) by sample station relative to the geometric mean criterion for samples collected during the 2015 designated monitoring season. The box represents the inner quartile range (25th to 75th percentiles), and upper and lower whiskers extending from the box represent the smallest and largest observations within one step (1.5 times inner quartile range). The median (\diamond) is marked by a line through the box, and horizontal bars (—) represent extreme values.

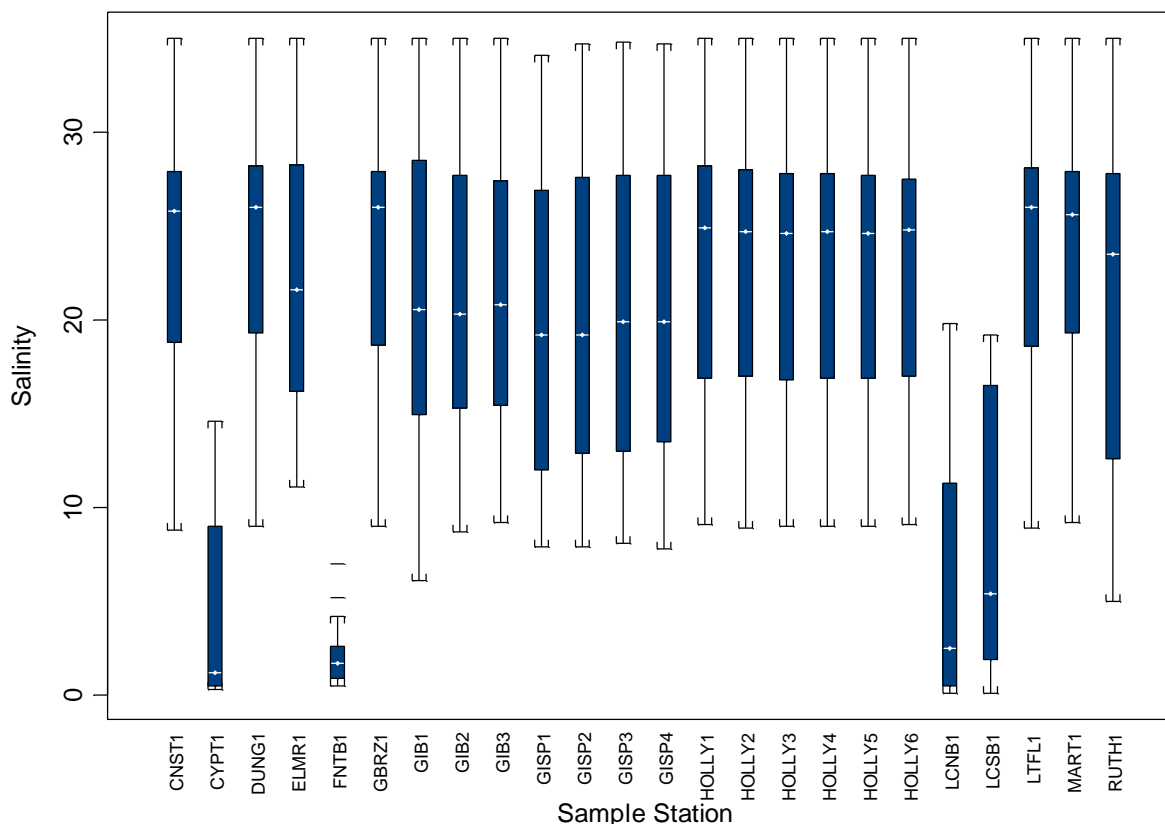


Figure 2. The distribution of salinity (ppt) by sample station for samples collected during the 2015 designated monitoring season.

Time-Series of 2015 Designated Monitoring Period Samples

In addition to calculating summary statistics for each sample station over the 2015 designated monitoring period, results are presented as a time-series (Appendix B, Figures B.1 through B.24; data for each sample event is provided in Appendix C). Because sample results were used during the designated monitoring season to make weekly determinations of whether or not water quality at each sample station met the Program's beach monitoring criteria for Tier 1 and 2 beaches, sample results and the running 30-day geometric mean are shown in the figures. In each week, the last enterococci sample of the week and the running 30-day geometric mean for enterococci must both be less than or equal to their respective criterion for the sample station to be classified as in compliance. If any criterion was exceeded, the sample station was classified as not in compliance and a swimming advisory was issued. The advisory remained in effect until the most recent sample results and the running geometric means were all less than or equal to their respective criterion.

Weekly Decision Rule Outcomes

During the 2015 swimming season (1 May – 31 October), 24 sample stations were monitored at ten Tier 1 or 2 continuous beach segments with a total of 65 advisories issued. Advisories were issued at 22 of the 24 Tier 1 or 2 sample stations during 2015 based on observed water quality exceedances (see Tables 8 and 9). There were no advisories issued at GIB1 and GISP1. Compliance at stations with advisories varied between 95% of monitored days in compliance at GISP4, to a low of 30% for RUTH1. Across all monitored sample stations, 70% (3,093 of 4,392) of the 2015 swimming season's available station-days (monitored station-days not under closure) were in compliance and not under an advisory. No beach closures were issued in 2015 unlike in prior years when closures were issued for hurricanes and beach enrichment construction activities.

Advisories issued in 2015 resulted from exceedances of enterococci geometric mean and single sample maximum criteria (Table 10). The enterococci GM was exceeded in 196 of 225 (87%) observed noncompliance weeks, with 117 (52%) of those noncompliance weeks resulting from enterococci geometric mean exceedances only, 79 (35%) resulting from both enterococci geometric mean and single sample maximum exceedances, and 29 (13%) resulted from exceedance of enterococci single sample maximum criterion alone. As discussed in previous Louisiana BEACH Grant reports, Louisiana's percentage of monitored station-weeks that were in compliance is not directly comparable with other states that do not use equivalent decision criteria. If Louisiana's decision rule was based only on the enterococci single sample maximum criterion, the State would have had 52% fewer noncompliance weeks during 2015.

When exceedances of beach monitoring criteria were detected, an advisory was issued. To notify the public that a swimming advisory was in effect, the BEACH Program's monitoring/advisory sign at the sample site was opened, a press release was issued, and notice of the advisory was placed on the OPH BEACH website (<http://new.dhh.louisiana.gov/index.cfm/page/288>).

Table 8. Advisory history by sample station and week for beach segments designated and monitored as either Tier 1 or Tier 2 beaches during the 2015 swimming season.

Station ID	Advisory Condition as of Friday for Each Week - 2015 Swimming Season																									
	May				June				July					August				September				October				
	8	15	22	29	5	12	19	26	3	10	17	24	31	7	14	21	28	4	11	18	25	2	9	16	23	30
CNST1	A						A		A	A	A															A
CYPT1		A		A	A	A									A	A	A	A	A	A	A	A	A	A	A	A
DUNG1	A						A		A	A	A	A	A													A
ELMR1														A	A	A										
FNTB1						A	A	A	A	A	A	A	A	A	A	A	A	A	A							A
GBRZ1							A		A	A	A					A										A
GIB1																										
GIB2				A					A				A	A	A	A	A									
GIB3														A	A	A	A	A								
GISP1																										
GISP2														A			A	A								
GISP3									A	A			A								A					
GISP4									A																	
HOLLY1							A		A	A	A	A	A	A	A											A
HOLLY2							A		A	A	A	A	A	A	A											A
HOLLY3							A	A	A	A	A	A	A						A			A	A			A
HOLLY4				A	A	A	A	A	A	A	A	A	A									A				A
HOLLY5							A		A	A	A	A	A									A				A
HOLLY6	A	A		A			A		A	A	A	A	A	A								A				A
LCNB1	A	A	A	A	A	A	A	A											A			A	A	A		A
LCSB1	A	A	A	A	A	A	A	A	A	A	A								A	A	A	A	A	A	A	A
LTFL1	A	A					A			A	A															A
MART1							A	A	A	A	A															A
RUTH1	A	A	A	A	A	A	A	A	A	A	A	A	A	A								A	A	A	A	A

Notes: “A” indicates an advisory was put in place or remained in effect at the beach based on observed water quality data. FOUR1-FOUR4, and HACK1 are not shown as they were not sampled in 2015 due to access constraints.

Table 9. Summary of 2015 advisories and closures.

State ID	Days Under Closure	% of Station-Days Under Closure	Days Under Advisory	% of Season Under Advisory	Days Under Closure or Advisory	% of Season Under Closure or Advisory	% of Available Season Open & In Compliance
CNST1	0	0%	37	20%	37	20%	80%
CYPT1	0	0%	103	56%	103	56%	44%
DUNG1	0	0%	50	27%	50	27%	73%
ELMR1	0	0%	22	12%	22	12%	88%
FNTB1	0	0%	99	54%	99	54%	46%
GBRZ1	0	0%	37	20%	37	20%	80%
GIB1	0	0%	0	0%	0	0%	100%
GIB2	0	0%	51	28%	51	28%	72%
GIB3	0	0%	36	20%	36	20%	80%
GISP1	0	0%	0	0%	0	0%	100%
GISP2	0	0%	22	12%	22	12%	88%
GISP3	0	0%	28	15%	28	15%	85%
GISP4	0	0%	9	5%	9	5%	95%
HOLLY1	0	0%	58	32%	58	32%	68%
HOLLY2	0	0%	58	32%	58	32%	68%
HOLLY3	0	0%	68	37%	68	37%	63%
HOLLY4	0	0%	76	42%	76	42%	58%
HOLLY5	0	0%	50	27%	50	27%	73%
HOLLY6	0	0%	78	43%	78	43%	57%
LCNB1	0	0%	83	45%	83	45%	55%
LCSB1	0	0%	127	69%	127	69%	31%
LTFL1	0	0%	42	23%	42	23%	77%
MART1	0	0%	35	19%	35	19%	81%
RUTH1	0	0%	128	70%	128	70%	30%
Totals	0	0%	1297	30%	1297	30%	70%

Notes: FOUR1-FOUR4 and HACK1 are not included in this table because they were not monitored in 2015 due to access constraints.

Table 10. Summary of weekly decision rule exceedances by cause for 2015.

Cause of Exceedance	Number of Observed Exceedances	% of Observed Exceedances
Only Enterococci geometric mean criterion exceeded	117	52%
Only Enterococci single sample max criterion exceeded	29	13%
Both Enterococci geometric mean and single sample max criteria exceeded	79	35%
Total	225	100%

Relationship between Indicator Organisms and Environmental Conditions

With each water sample collected by the BEACH Program, environmental variables were also collected, including surface water temperature (°F), salinity (ppt), tide conditions, weather conditions, and wind direction and speed. Total precipitation (in.) 0–24 hrs (precip0), 24–48 hrs

(preciplag1), 48–72 hrs (preciplag2), and 72–96 hrs (preciplag3) prior to sample collection were estimated using rain basin precipitation values taken from Louisiana’s Molluscan Shellfish database. Rain basin daily precipitation was estimated by averaging observed precipitation at rain gauges within the rain basin, and beaches were assigned to the rain basin in which they occurred. The number of days between sample collection and the most recent prior day with a precipitation record > 0 (DaysSinceLastRain) was estimated, and daily precipitation estimates were summed into measures of total precipitation within 0–48 hrs (precip48) and 0–72 hrs (precip72) prior to sample collection.

Using the observed environmental variables, estimated precipitation values and the associated \log_e transformed enterococci densities collected by the Program from 2004 through 2009, CEHS performed a thorough statistical analysis to determine how indicator organism density was influenced by environmental factors at Louisiana’s coastal beaches (the 2009 analysis). The results of the 2009 analysis confirmed the findings of previous reported analyses that there were no statistically meaningful differences among sample stations within continuous beach segments (StateID explains almost none of the variation in enterococci density), and that enterococci densities have changed from year to year (Year) at all beach segments except Fourchon, which had remained stable. The complete results of the 2009 analysis were reported in the *Louisiana BEACH Grant Report, 2009 Swimming Season*, which concluded that:

“given the available data, it is unlikely that models that can reliably predict enterococci densities can be developed for Louisiana’s beaches. Different environmental factors are most correlated with enterococci density for different beach segments and area groups, and no single environmental factor is useful in predicting indicator organism density. It also appears that the relationship between environmental factors and enterococci density is complex and will take more investigation to understand, requiring targeted studies that are not funded under current Beach Grants. Better measurement of the environmental variables that are currently being collected and/or collection of additional environmental measures may be required to adequately predict water quality from observable environmental conditions. Louisiana beaches are somewhat different from those of most coastal states in that they represent a wide range of salinity conditions and most are relatively remote from urban runoff, reducing the direct association between environmental conditions and enterococci densities.”

Through 2011, a total of 5,164 independent¹ samples were collected; 1,555 samples beyond those available in 2009. Given the additional data available, the analysis was repeated and yielded the same conclusions as were drawn following the 2009 analysis. That is, year-to-year differences in enterococci density at all beach segments other than FOUR was a significant source of variation, and that for most beach segments, the relationship between the environmental variables and enterococci density changed from year to year. Additionally, the observed year-to-year variation in enterococci density was not explained by corresponding differences in the environmental variables.

¹ For analysis purposes, single samples collected on a date at a sample location were considered independent; multiple samples collected on a date at a sample location were averaged together and considered independent.

Because of large year-to-year differences in enterococci densities and associated annual variance within beach segments, and annual differences in the relationship between enterococci density the environmental variables as shown in the 2011 Annual Beach Report, developing useful statistical models that go beyond describing general patterns of association between environmental conditions and enterococci densities may not be possible for Louisiana's more remote beaches.

Figure 3 shows the considerable annual variation in enterococci densities within beach segments from Program inception through 2015. Enterococci density during 2015 was greater than during 2014 at all beach segments except Constance Beach Complex, Elmer's Island, and Grand Isle State Park, which remained relatively stable between 2014 and 2015, and Fontainebleau State Park, which had lower enterococci density during 2015.

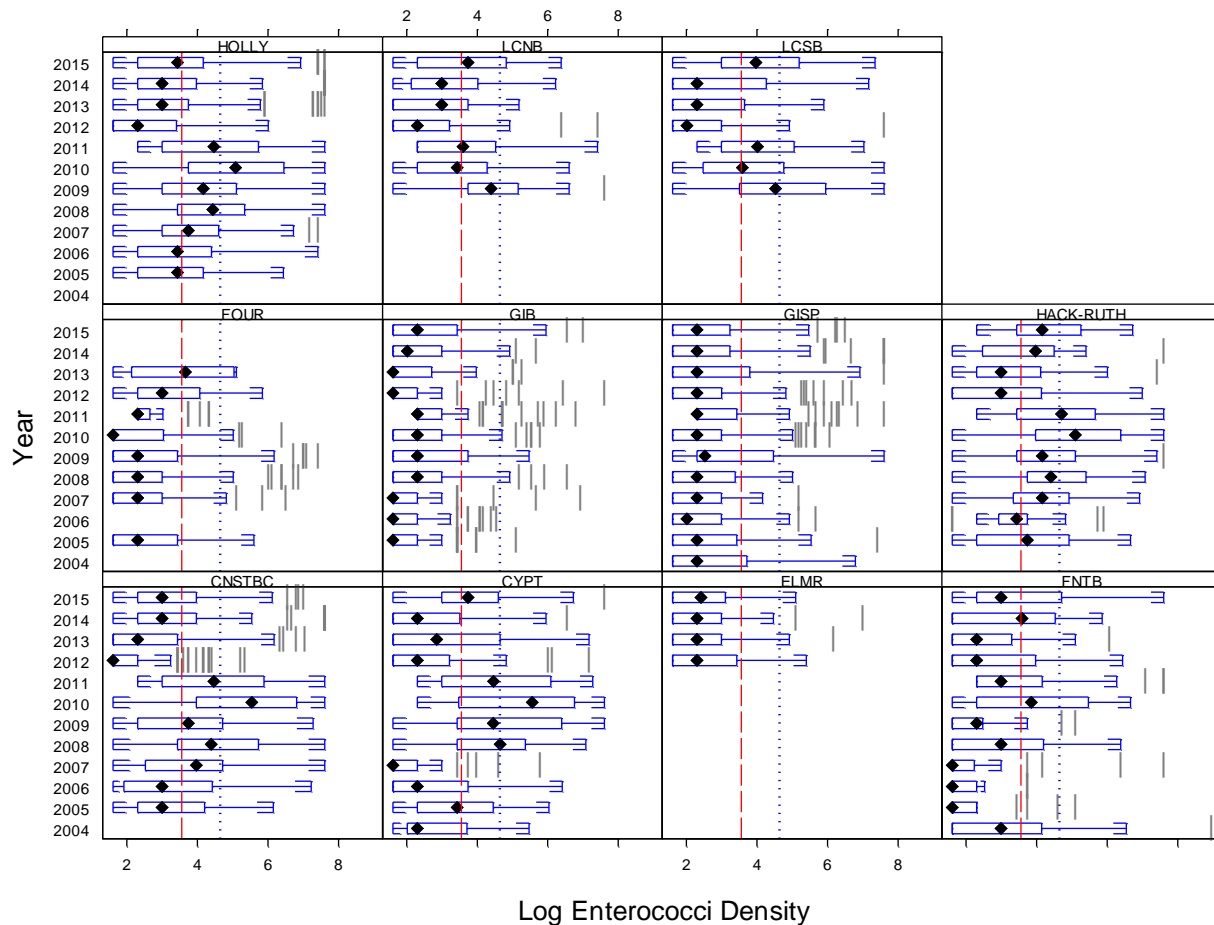


Figure 3. Distribution of \log_{10} enterococci densities by year within continuous beach segments relative to geometric mean criterion (red dashed lines) and single sample maximum criterion (blue dotted lines).

CHAPTER 4. Evaluation of Program Performance Relative to Data Quality Objectives.

Louisiana's BEACH Program Quality Assurance Project Plan (LDHH 2015) states that at the end of each year, the Program Manager shall audit the Program to determine if the Program's data quality objectives are being met. As described in the QAPP (see Table A7.1 of the QAPP), the Program's data quality objectives for those parameters measured in accordance with the QAPP are expressed in terms of accuracy, precision, and completeness goals. Those data quality objectives are repeated below in Table 11, together with their 2015 results.

Table 11. Data quality objectives and 2015 results.

Parameter	Concentration Units	QAPP Precision Goals (RPD)	2015 Precision Mean RPD (± 1 SE, n)	QAPP Completeness Goals	2015 Completeness
Enterococci	MPN/100ml	Sample 60%; lab 45%	Sample 61.4% (± 7.2 , 40); lab 43.3% (± 6.0 , 37)	98%	100%
Salinity	ppt	Sample 10%, lab 5%	Sample 0.5% (± 0.2 , 40); lab 0.3% (± 0.1 , 37)	98%	99%
Surface Water Temperature	°F	$\pm 2^\circ$	$\pm 2^\circ$ by SOP	98%	99%
Tide Conditions	NA	NA	NA	98%	100%
Weather	NA	NA	NA	98%	100%
Wind Direction	NA	NA	NA	98%	100%
Wind Speed	NA	NA	NA	98%	100%
Precipitation	Inches/ previous 24 hours	NA	NA	98%	100%
River Stage	Feet on flood gauge	NA	NA	98%	100%

To evaluate compliance with the established data quality objectives (DQOs) for sample and laboratory precision on estimated indicator organism densities and salinity, the results from QC samples, which are always collected in conjunction with a routine sample, calibration sample or resample, were compared to the corresponding sample result. Prior to the start of the monitoring period, approximately 10% of scheduled samples (routine and calibration samples) were designated as quality control samples. QC samples were selected at random at the beginning of the sampling period in approximately equal proportions (~ 5% each) of field duplicate and field split samples. Unscheduled QC samples were also collected during some routine sample events, which are also included in the QC evaluation. Sampling and laboratory precision were then estimated from each quality control sample by calculating the relative percent difference (*Sample RPD*) as follows:

$$\text{Sample RPD} = \frac{|C_1 - C_2|}{(C_1 + C_2)/2} \times 100$$

where C_1 is the routine sample (or calibration or resample) result and C_2 is the quality control sample result. To estimate precision across samples, the mean and standard deviation of Sample RPDs were calculated. Note that the precision goals are expressed as means, and compliance with precision goals is assessed by determining if the observed precision is statistically different from the goal.

As described in Chapter 3, a total of 77 quality control samples were collected during 2015, consisting of 40 field duplicates and 37 field-split samples. To evaluate compliance with QAPP precision goals, means and standard errors of sample RPDs were calculated for the 2015 QC samples and are presented in Table 11. Figures 4-5 show Sample RPD results relative to precision goals; if the lower error bar (lower 95th percentile) shown in the graph is below the goal, then the goal has been achieved. All precision goals were achieved for 2015. Field splits were designed to estimate the variability of the analysis process, or “lab” precision, plus any minor imprecision resulting from sample handling and transport. Field duplicates were designed to incorporate lab variability plus sampling variability to estimate the variability of collecting another sample at approximately the same place and time.

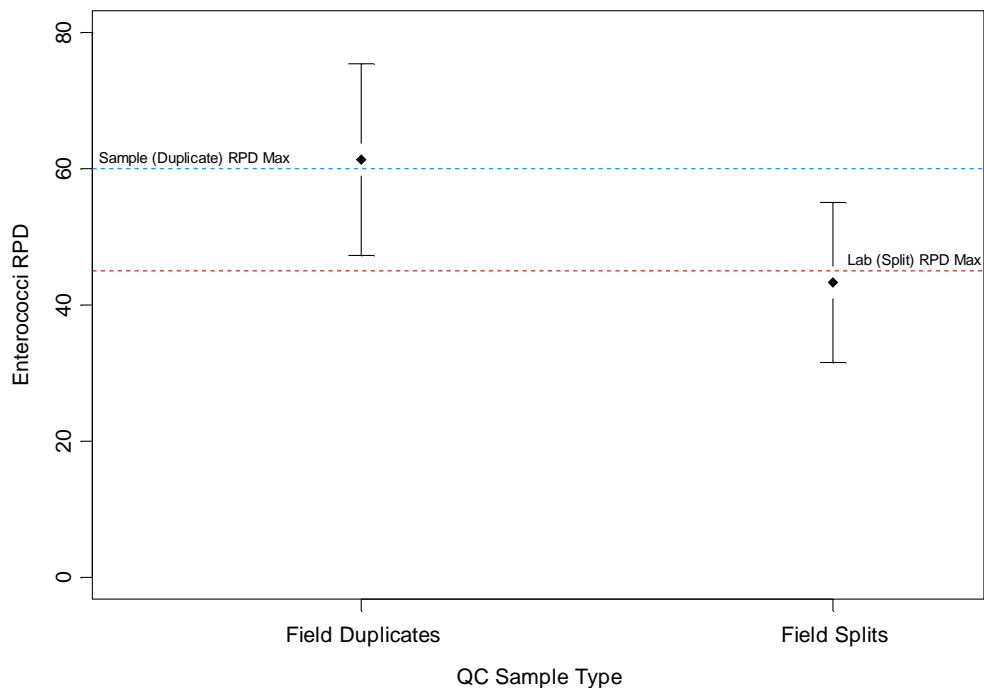


Figure 4. Comparison of 2015 monitoring season mean enterococci relative percent difference (RPD) for field duplicates and field splits with QAPP precision goals. Means are represented by diamonds and upper and lower 95th percentiles of the mean are shown as error bars.

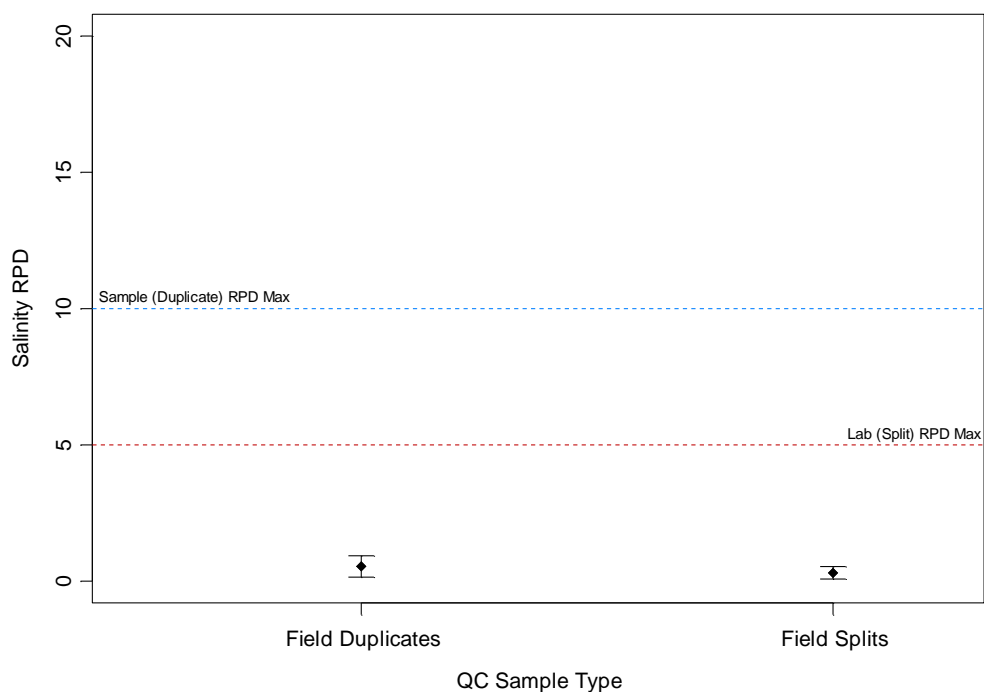


Figure 5. Comparison of 2015 monitoring season mean salinity relative percent difference (RPD) for field duplicates and field splits with QAPP precision goals. Means are represented by diamonds and upper and lower 95th percentiles of the mean are shown as error bars.

Completeness is the percentage of measurements made that are judged to be valid according to specific criteria and entered into the data management system. Percent completeness (%C) for measurement parameters was estimated as follows:

$$\%C = \frac{V}{T} \times 100$$

where *V* is the number of measurements judged valid and *T* is the total number of measurements. During 2015, a total of 772 samples were successfully processed, and all results were considered valid and recorded in the Program's database.

Based on a thorough review of the data recorded for the 2015 season, all completeness goals were achieved, and there were no variances from the QAPP detected. In addition to the audit and data review described above, the BEACH Program Manager/Quality Assurance Officer verified throughout the 2015 sampling period that:

- All elements of the QAPP were being correctly implemented as prescribed;
- The quality of the data generated by implementation of the QAPP was adequate; and
- Corrective actions, when needed, were implemented in a timely manner and their effectiveness was confirmed.

All monitoring and notification data collected during 2015 have been uploaded to USEPA's BEACH (PRAWN) and STORET data systems via submission of a XML formatted files to the Exchange Network Services Center.

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APPENDIX A

Sample Station Names and USEPA IDs

List of sample stations designated under the Louisiana BEACH Program by State ID, Beach Name, and USEPA IDs.

State ID	Beach Name	USEPA ID
CNST1	Constance Beach	LA134778
CYPT1	Cypremort Point State Park	LA971783
DUNG1	Long Beach	LA860482
ELMR1	Elmer's Island - 1	LA834833
ELMR2	Elmer's Island - 2	LA451844
FNTB1	Fontainebleau State Park	LA733869
FOUR1	Fourchon - 1	LA427986
FOUR2	Fourchon - 2	LA984228
FOUR3	Fourchon - 3	LA677480
FOUR4	Fourchon - 4	LA452669
GBRZ1	Gulf Breeze	LA725358
GIB1	Grand Isle Beach - 1	LA430483
GIB2	Grand Isle Beach - 2	LA325065
GIB3	Grand Isle Beach - 3	LA799656
GISP1	Grand Isle State Park - 1	LA240078
GISP2	Grand Isle State Park - 2	LA221569
GISP3	Grand Isle State Park - 3	LA204303
GISP4	Grand Isle State Park - 4	LA186192
HACK1	Hackberry Beach	LA720012
HOLLY1	Holly Beach - 1	LA489985
HOLLY2	Holly Beach - 2	LA829030
HOLLY3	Holly Beach - 3	LA109442
HOLLY4	Holly Beach - 4	LA697221
HOLLY5	Holly Beach - 5	LA164373
HOLLY6	Holly Beach - 6	LA467180
LCNB1	North Beach	LA202517
LCSB1	South Beach and Rabbit Island	LA981443
LTFL1	Little Florida	LA595220
MART1	Martin Beach	LA135245
PONT1	Pontchartrain Beach	LA960851
RUTH1	Rutherford Beach	LA284049

APPENDIX B

Time Series of Water Quality Results By Sample Station

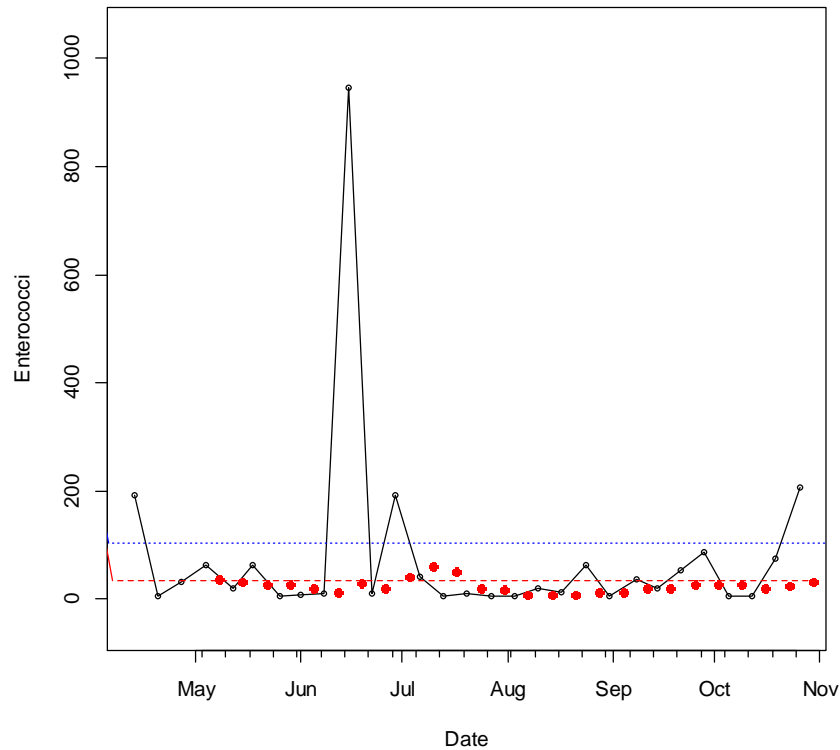


Figure B.1. Time series of enterococci sample results collected during 2015 at CNST1. Sample results are shown as open dots (○), running 30-day geometric means are shown as red dots (●), and geometric mean and single sample maximum criteria are shown as red and blue dashed horizontal lines, respectively.

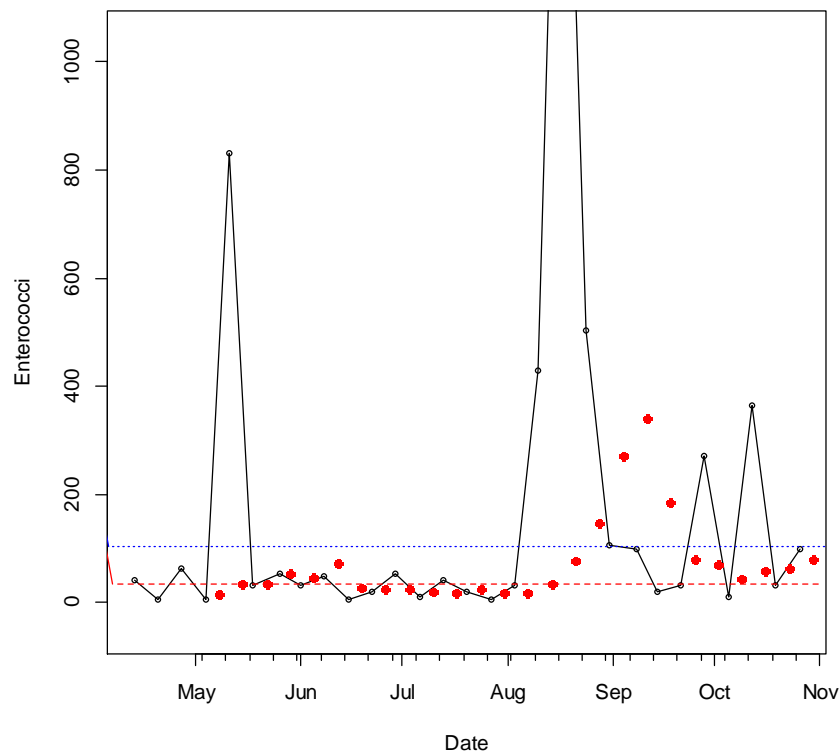


Figure B.2. Time series of sample results collected during 2015 at CYPT1.

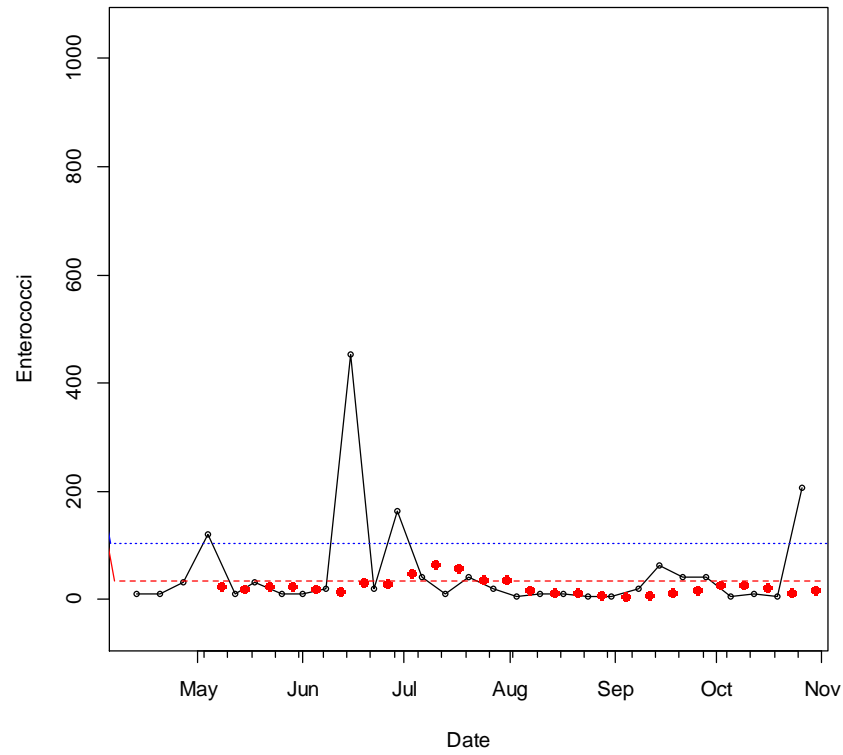


Figure B.3. Time series of sample results collected during 2015 at DUNG1.

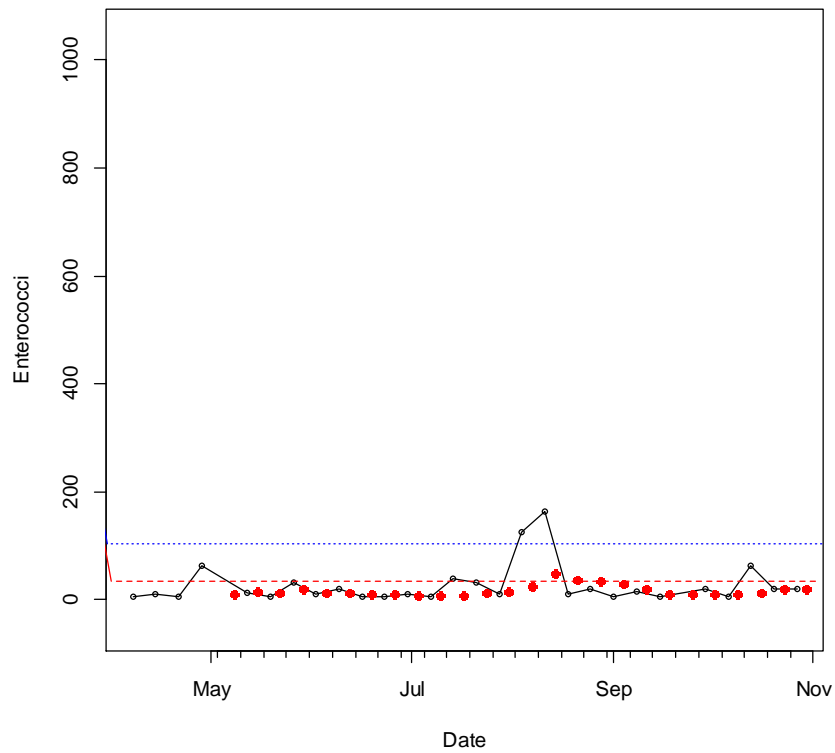


Figure B.4. Time series of sample results collected during 2015 at ELMR1.

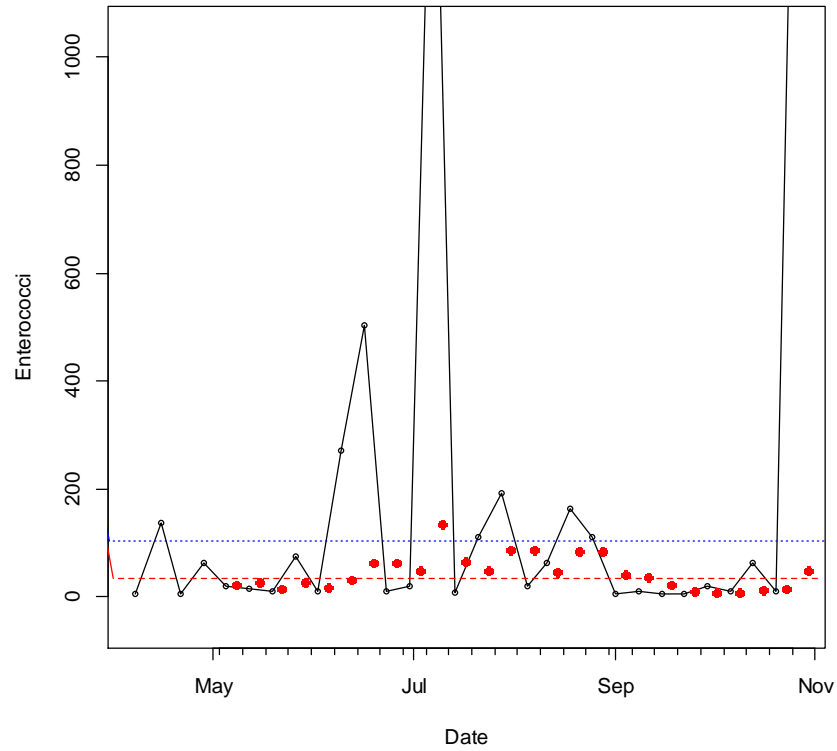


Figure B.5. Time series of sample results collected during 2015 at FNTB1.

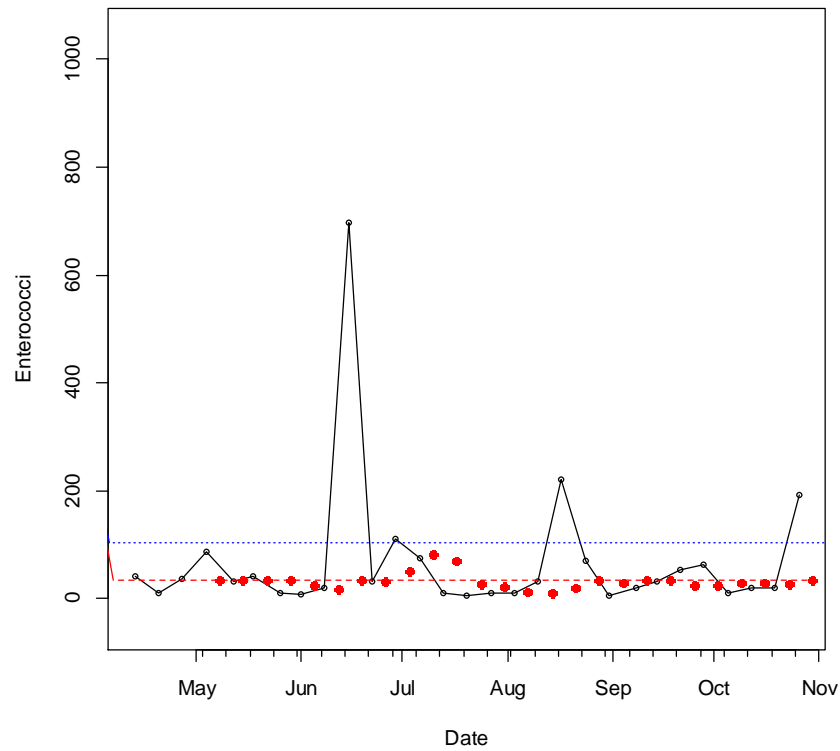


Figure B.6. Time series of sample results collected during 2015 at GBRZ1.

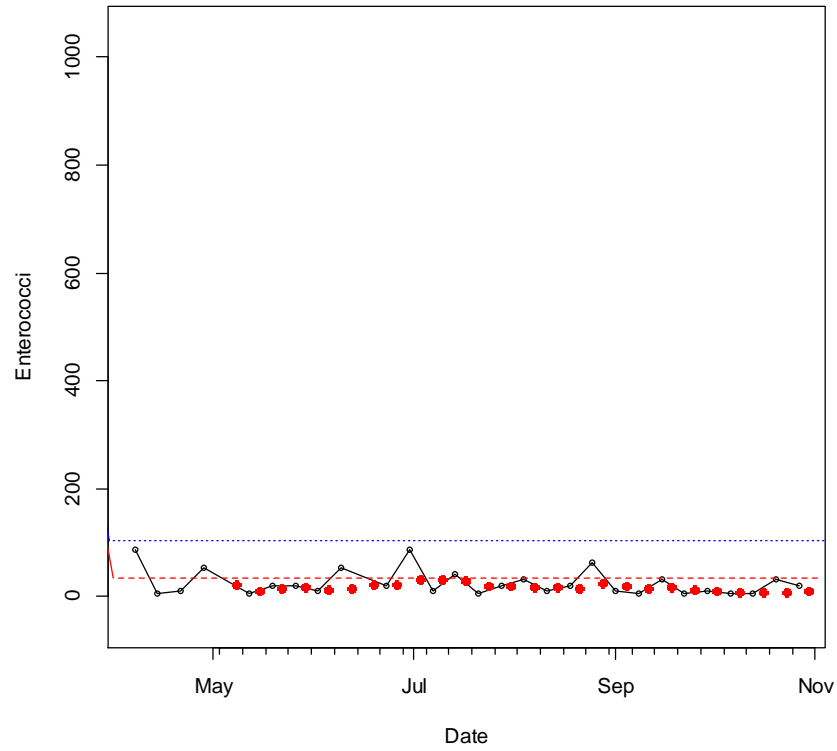


Figure B.7. Time series of sample results collected during 2015 at GIB1.

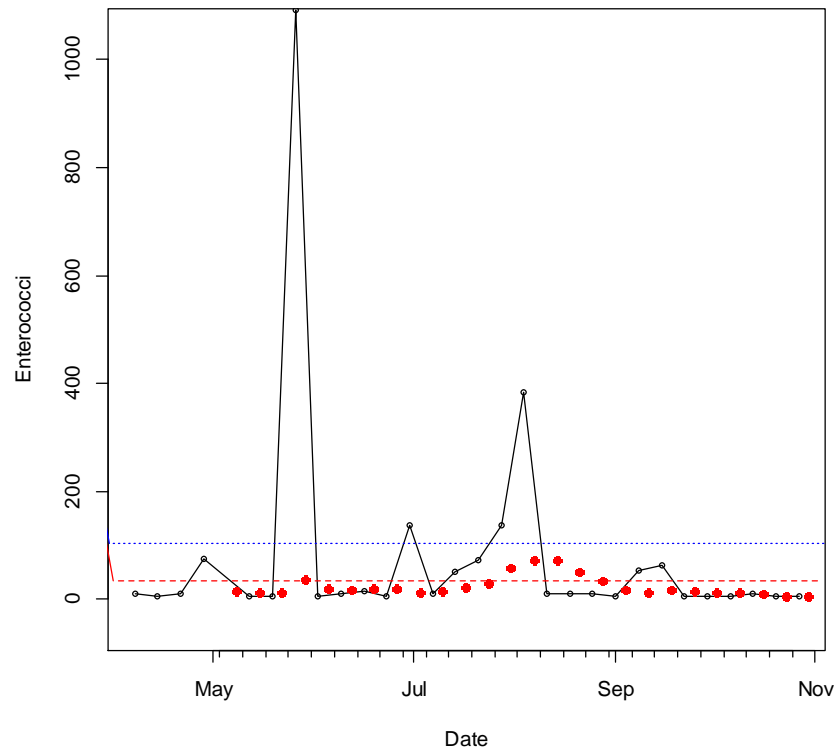


Figure B.8. Time series of sample results collected during 2015 at GIB2.

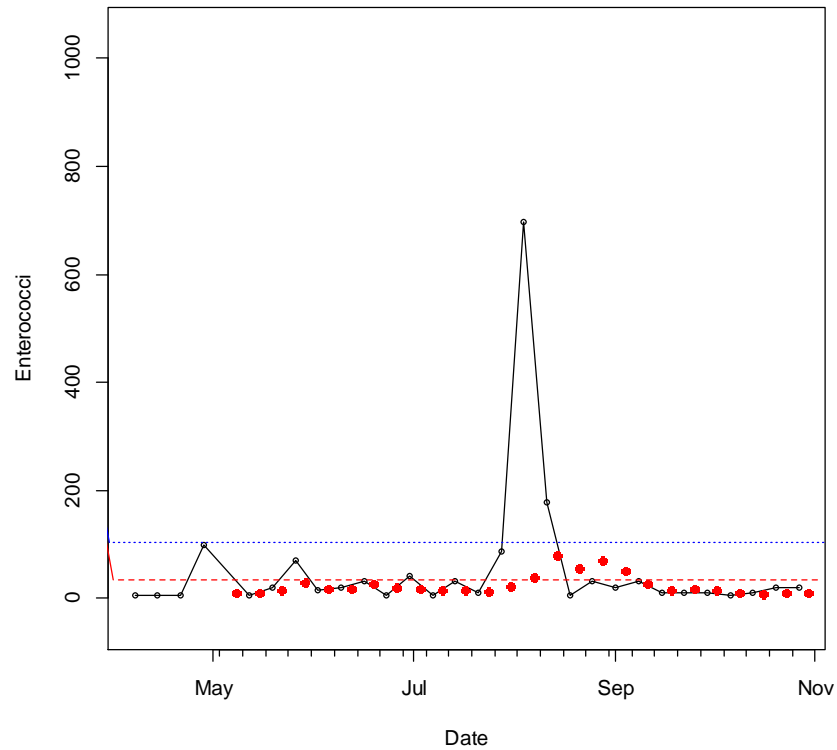


Figure B.9. Time series of sample results collected during 2015 at GIB3.

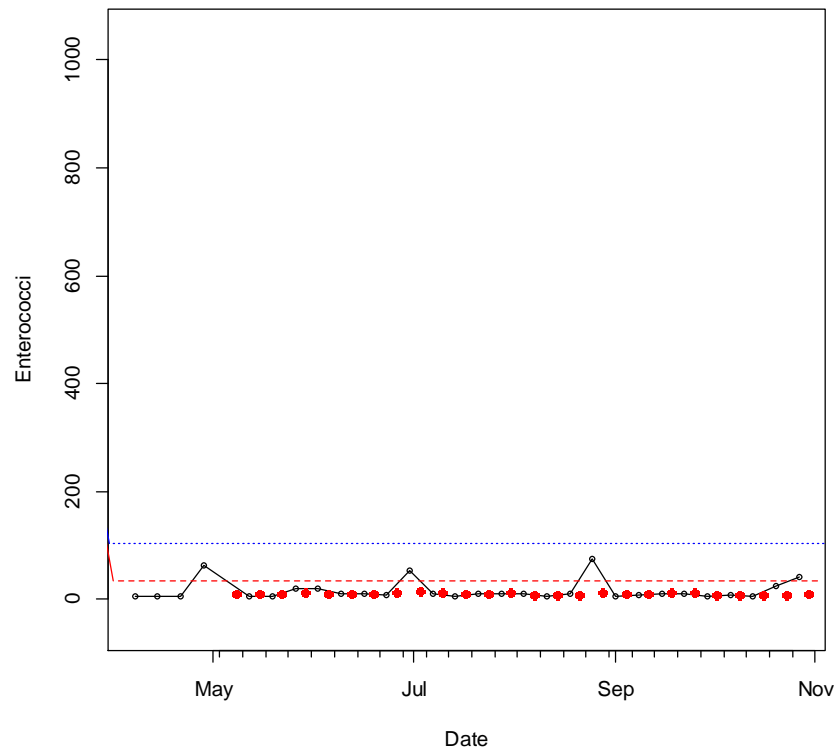


Figure B.10. Time series of sample results collected during 2015 at GISP1.

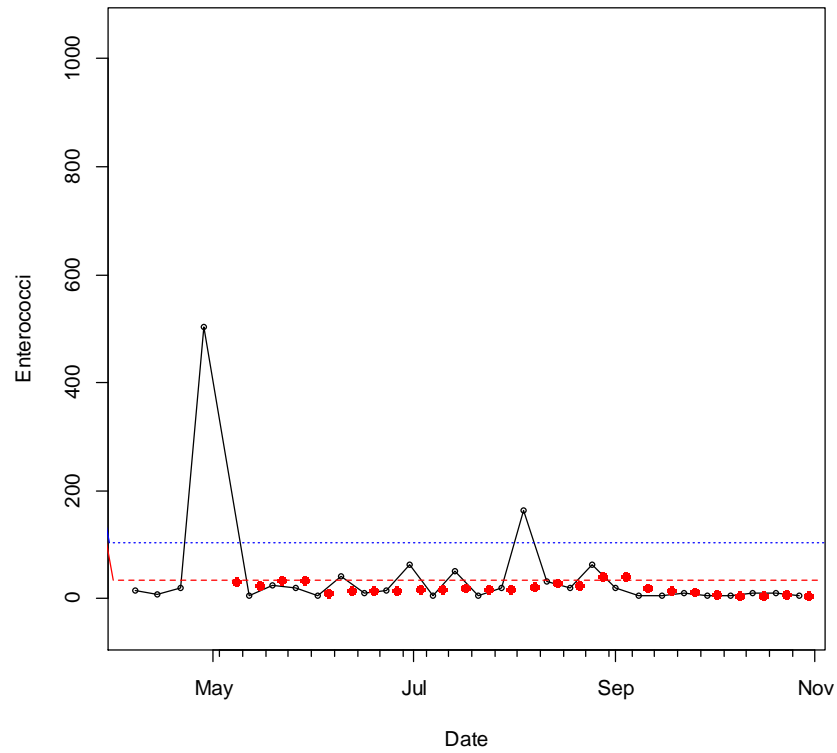


Figure B.11. Time series of sample results collected during 2015 at GISP2.

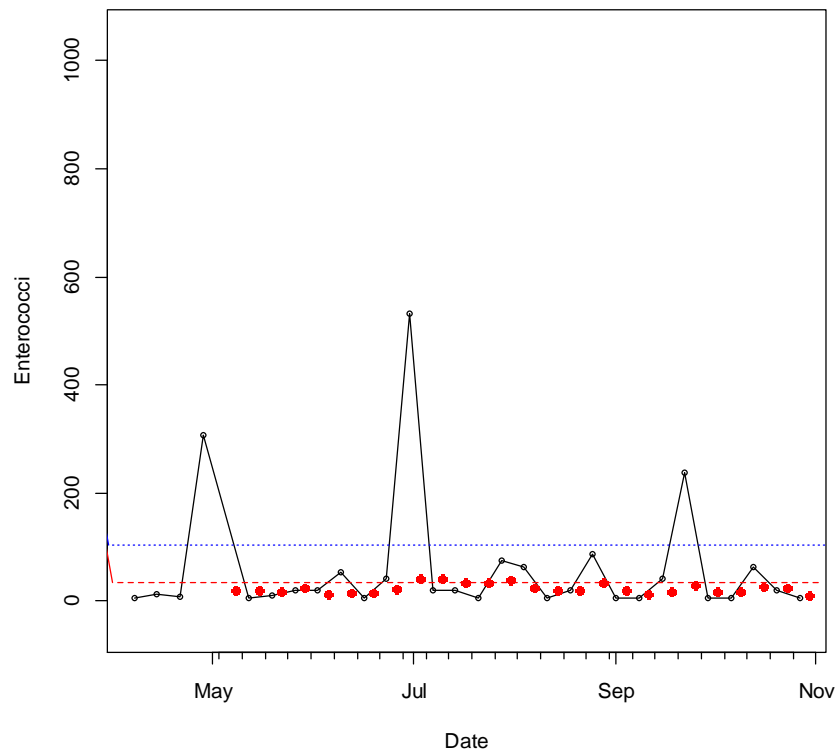


Figure B.12. Time series of sample results collected during 2015 at GISP3.

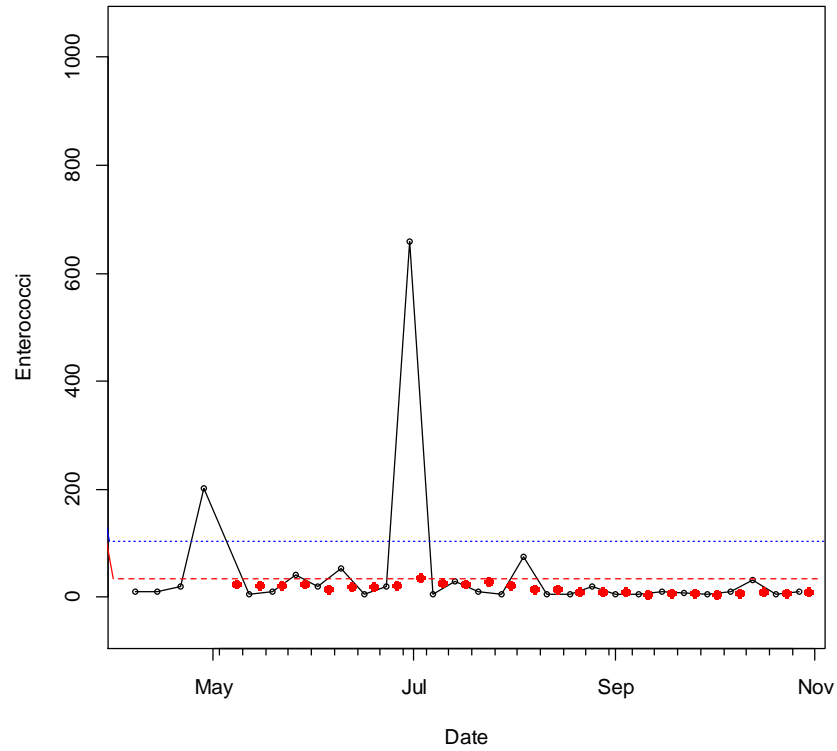


Figure B.13. Time series of sample results collected during 2015 at GISP4.

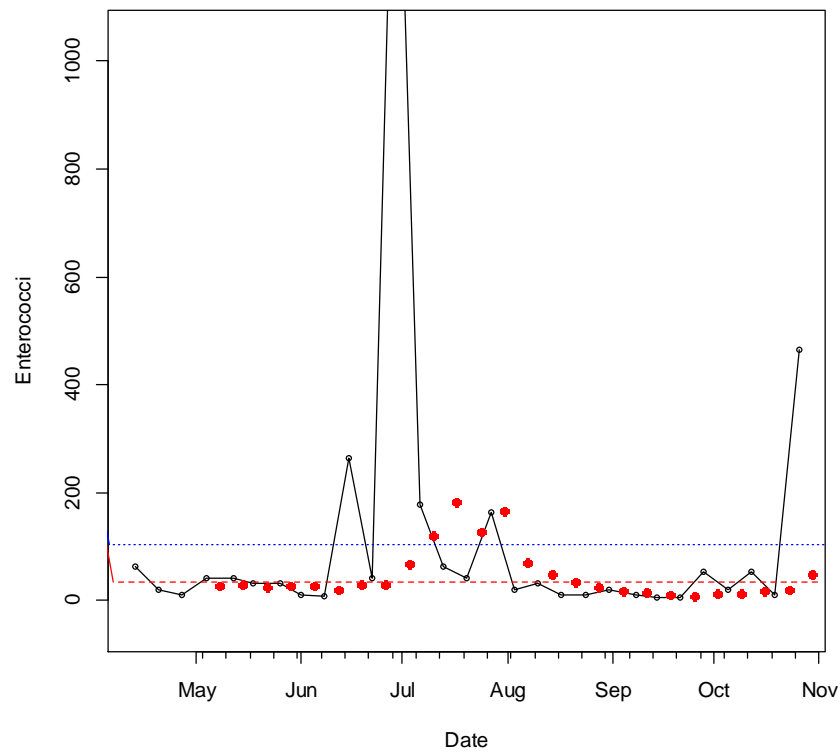


Figure B.14. Time series of sample results collected during 2015 at HOLLY1.

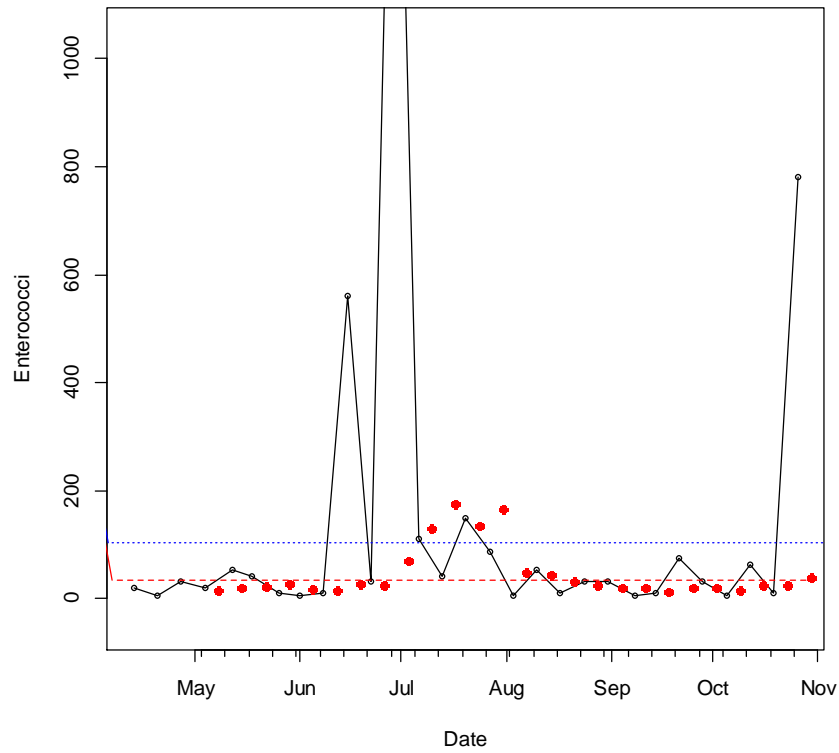


Figure B.15. Time series of sample results collected during 2015 at HOLLY2.

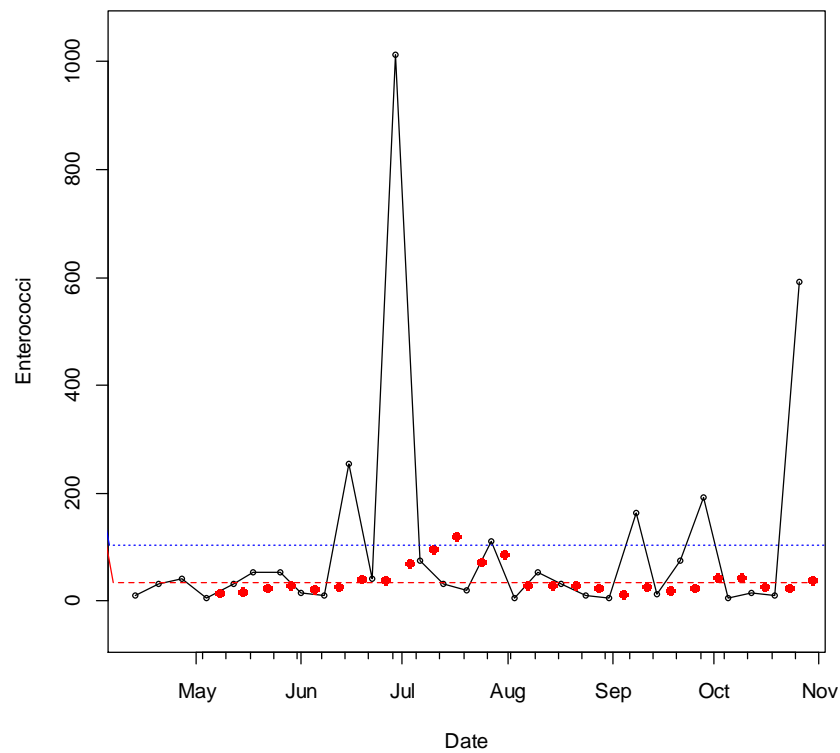


Figure B.16. Time series of sample results collected during 2015 at HOLLY3.

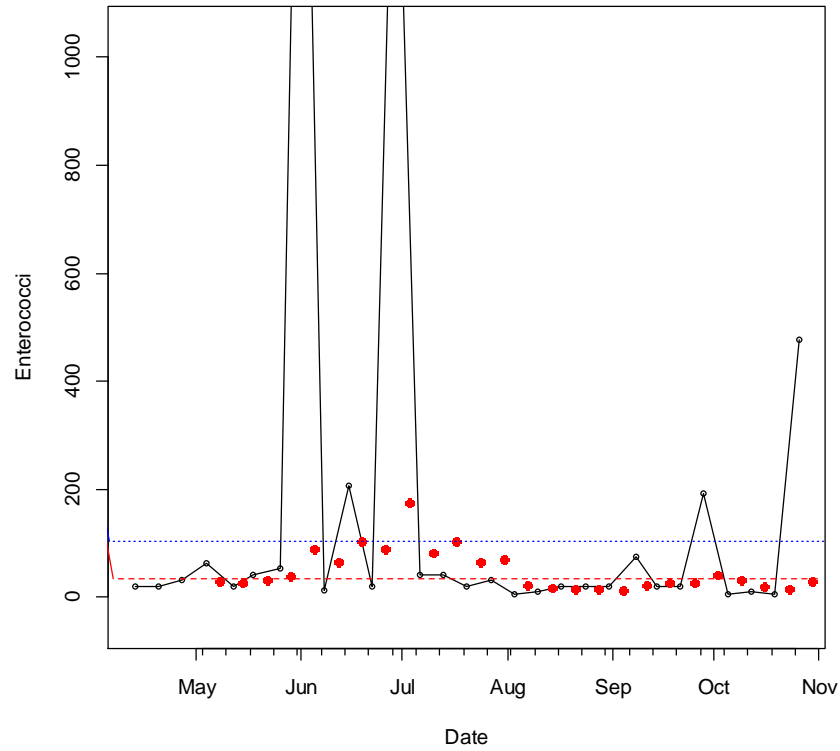


Figure B.17. Time series of sample results collected during 2015 at HOLLY4.

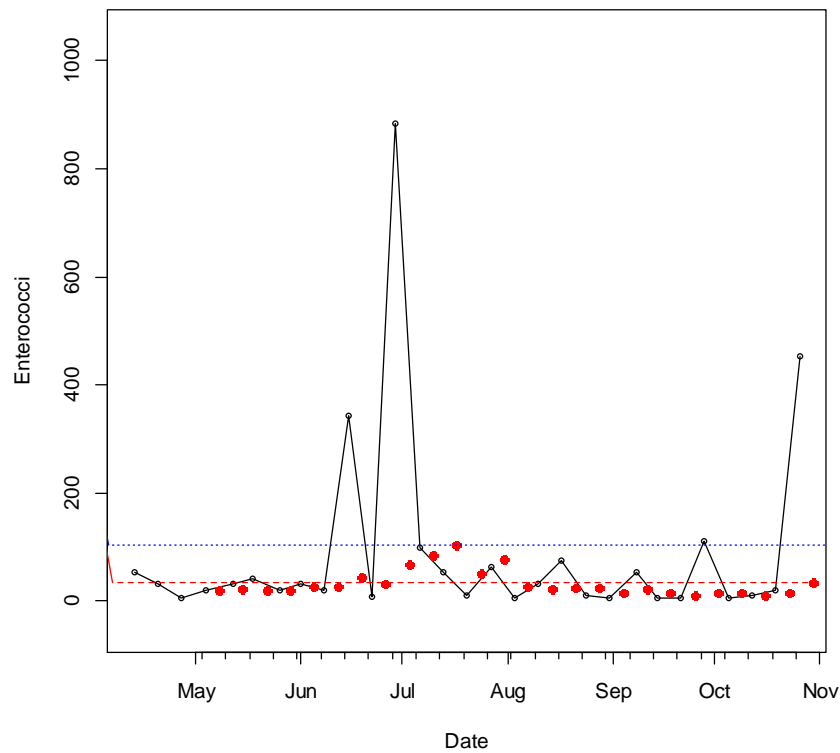


Figure B.18. Time series of sample results collected during 2015 at HOLLY5.

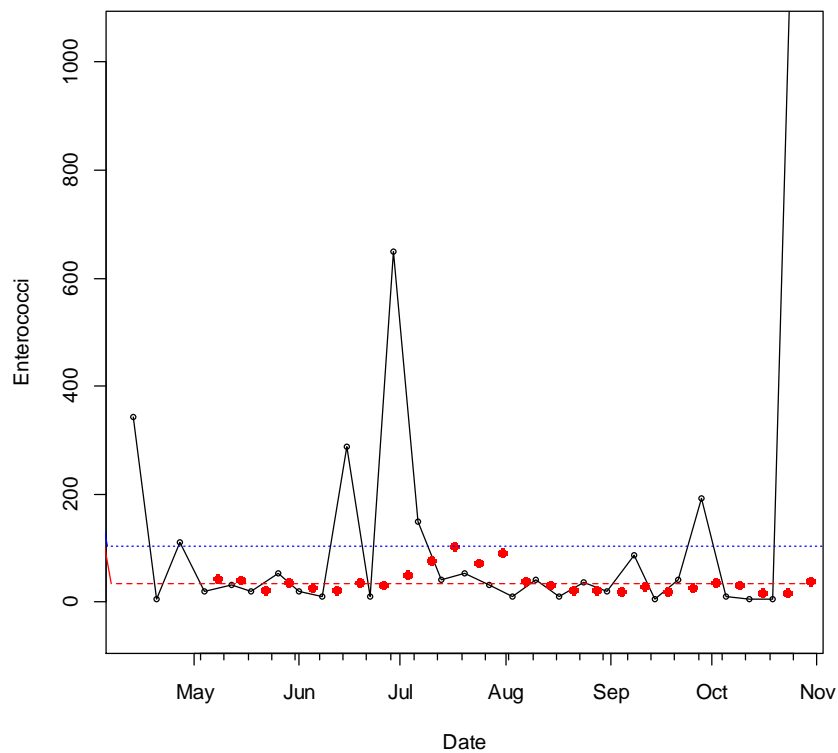


Figure B.19. Time series of sample results collected during 2015 at HOLLY6.

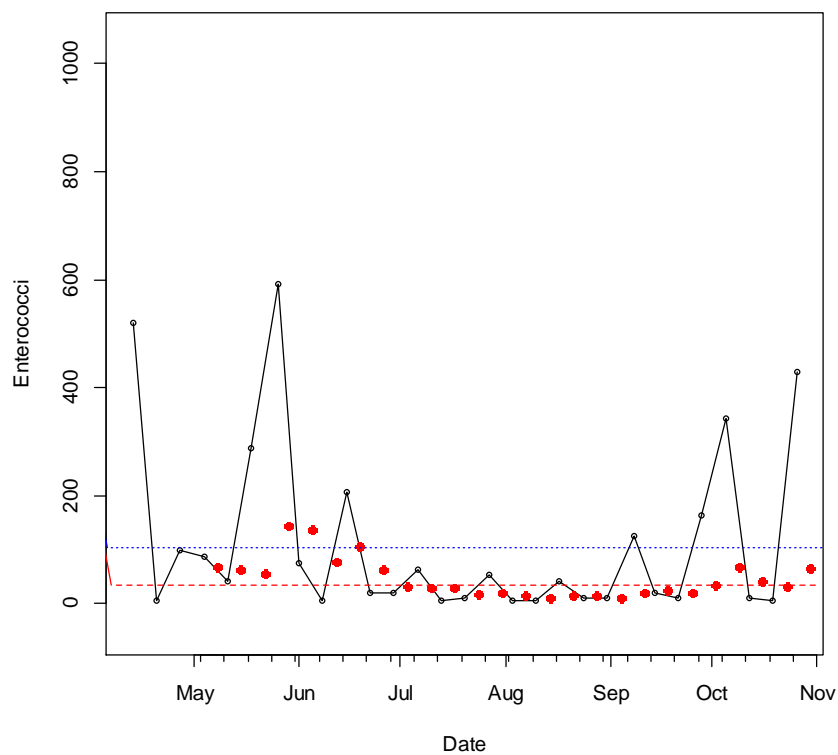


Figure B.20. Time series of sample results collected during 2015 at LCNB1.

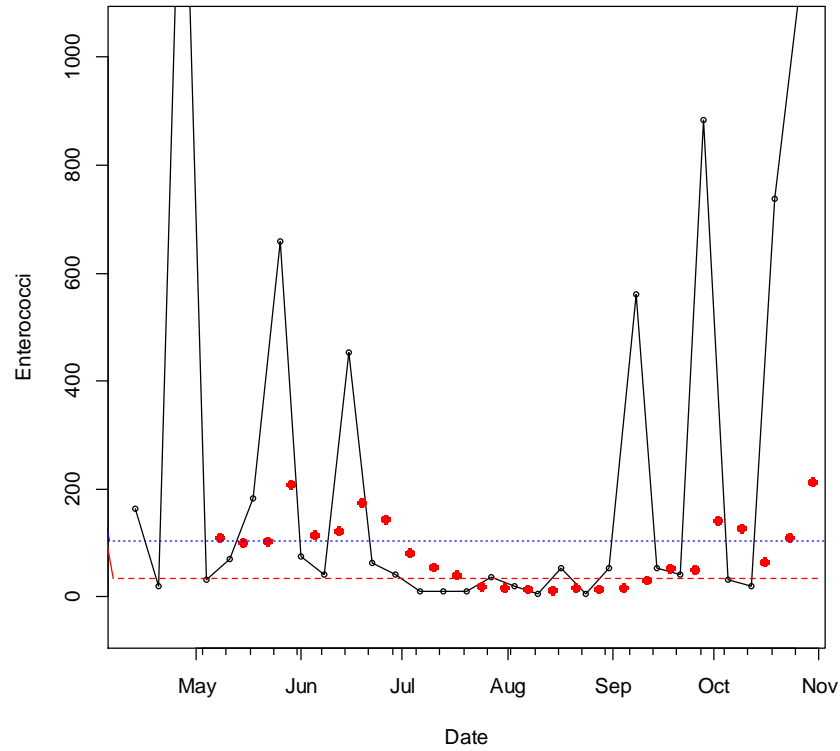


Figure B.21. Time series of sample results collected during 2015 at LCSB1.

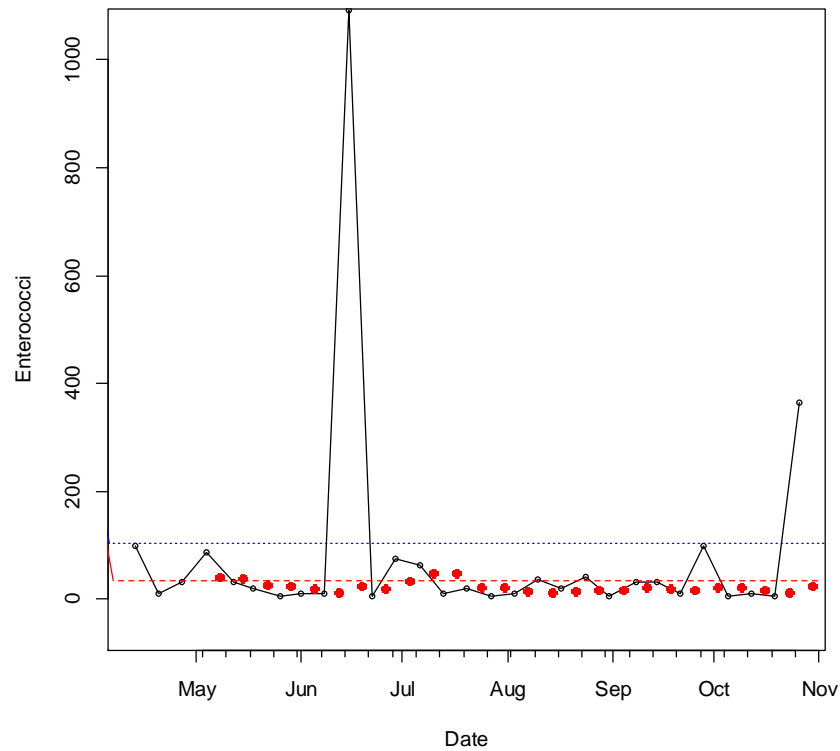


Figure B.22. Time series of sample results collected during 2015 at LTFL1.

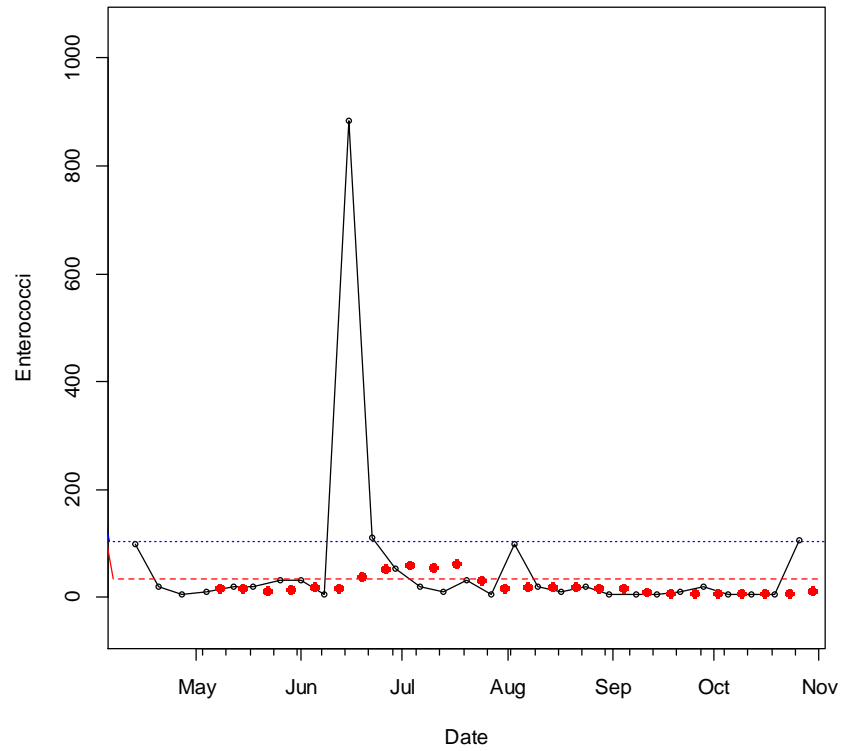


Figure B.23. Time series of sample results collected during 2015 at MART1.

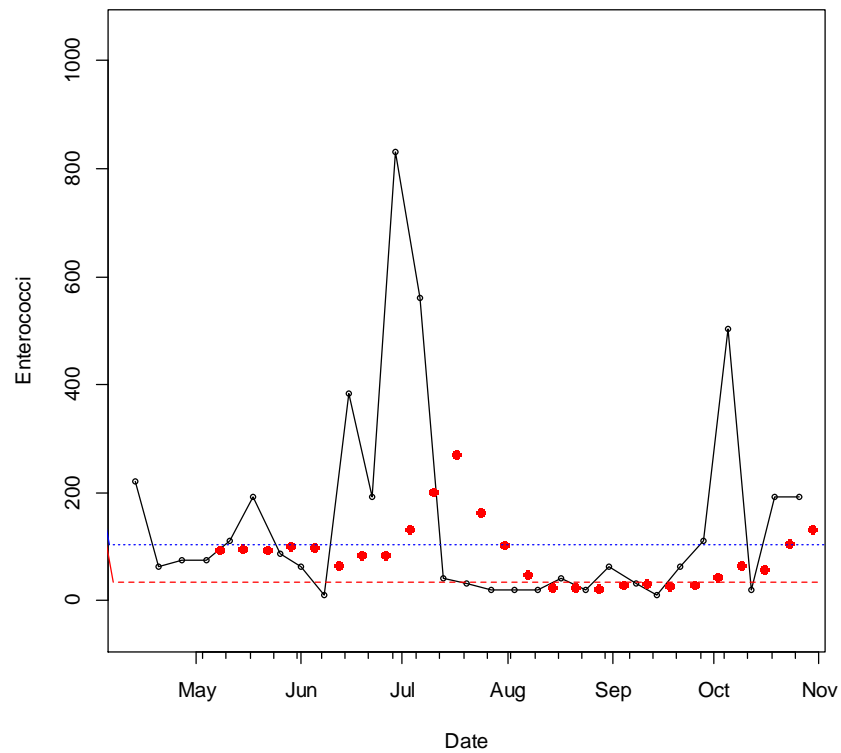


Figure B.24. Time series of sample results collected during 2015 at RUTH1.

APPENDIX C

Sample Results

2015 Beach Sample Results

Beach Station ID	Date	Time	Tide	Weather	Wind Direction	Wind Speed	Water Temp	Entero- cocci	Salinity	Sample Type
Constance Beach										
<i>CNSTI</i>	<i>Beach Name Constance Beach</i>									
	4/13/2015	6:50	Normal	Rain	South-Southeast	Moderate (10-15 mph)	73	192	15.2	Routine
	4/20/2015	7:00	High Tide	Scattered Clouds	Northwest	Moderate-Light (5-10 mph)	73	5	17.9	Routine
	4/27/2015	7:00	Low Tide Falling	Rain	East-Southeast	Moderate-Strong (15-20 mph)	74	31	17.1	Routine
	5/4/2015	6:45	Normal	Scattered Clouds	Southeast	Moderate-Light (5-10 mph)	74	64	25.8	Routine
	5/12/2015	6:30	Normal	Cloudy	Northeast	Moderate-Light (5-10 mph)	75	20	8.8	Routine
	5/18/2015	6:45	Normal	Partly Cloudy	South-Southeast	Moderate-Light (5-10 mph)	80	64	11.2	Routine
	5/26/2015	7:00	Normal	Partly Cloudy	Southeast	Moderate-Strong (15-20 mph)	78	5	18.0	Routine
	6/1/2015	6:45	Normal	Scattered Clouds	North	Moderate-Light (5-10 mph)	82	10	19.6	Field Split
	6/1/2015	6:45	Normal	Scattered Clouds	North	Moderate-Light (5-10 mph)	82	5	19.6	Routine
	6/8/2015	6:45	High Tide	Scattered Clouds	East-Northeast	Light (0-5 mph)	86	10	19.8	Routine
	6/15/2015	7:00	Normal	Partly Cloudy	South-Southeast	Moderate (10-15 mph)	84	945	18.8	Routine
	6/22/2015	6:45	High Tide	Partly Cloudy	South	Light (0-5 mph)	85	10	19.4	Routine
	6/29/2015	7:00	Normal	Partly Cloudy	West	Moderate-Light (5-10 mph)	82	192	30.2	Routine
	7/6/2015	7:00	High Tide	Scattered Clouds	South	Moderate-Strong (15-20 mph)	86	42	30.9	Routine
	7/13/2015	7:00	Low Tide Falling	Scattered Clouds	West-Northwest	Light (0-5 mph)	86	5	17.9	Routine
	7/20/2015	7:00	High Tide Falling	Scattered Clouds	West	Moderate-Light (5-10 mph)	86	10	33.1	Routine
	7/27/2015	7:15	Low Tide Falling	Scattered Clouds	West-Northwest	Light (0-5 mph)	86	5	34.9	Routine
	8/3/2015	11:00	High Tide Falling	Scattered Clouds	East-Northeast	Light (0-5 mph)	86	5	34.9	Routine
	8/10/2015	7:00	Low Tide Falling	Scattered Clouds	West-Northwest	Moderate-Light (5-10 mph)	86	20	35.0	Routine
	8/17/2015	6:45	High Tide Rising	Light Rain	East-Southeast	Light (0-5 mph)	86	5	27.9	Routine
	8/17/2015	6:45	High Tide Rising	Light Rain	East-Southeast	Light (0-5 mph)	86	20	27.9	Field Duplicate
	8/24/2015	7:00	Normal	Scattered Clouds	Northwest	Moderate-Light (5-10 mph)	86	64	25.2	Routine
	8/31/2015	7:00	Normal	Scattered Clouds	South-Southeast	Light (0-5 mph)	84	5	27.8	Routine
	9/8/2015	7:10	Normal	Partly Cloudy	East-Northeast	Light (0-5 mph)	85	42	26.0	Field Split
	9/8/2015	7:10	Normal	Partly Cloudy	East-Northeast	Light (0-5 mph)	85	31	26.0	Routine
	9/14/2015	7:00	Normal	Scattered Clouds	East-Northeast	Moderate-Light (5-10 mph)	78	20	26.8	Routine
	9/21/2015	7:20	Normal	Cloudy	Northeast	Moderate (10-15 mph)	83	53	26.5	Routine
	9/28/2015	7:15	Normal	Cloudy	East-Northeast	Moderate-Strong (15-20 mph)	80	87	25.3	Routine

Beach Station ID	Date	Time	Tide	Weather	Wind Direction	Wind Speed	Water Temp	Entero- cocci	Salinity	Sample Type
	10/5/2015	7:15	Normal	Scattered Clouds	North	Moderate-Light (5-10 mph)	70	5	26.3	Routine
	10/12/2015	7:15	Normal	Scattered Clouds	South	Moderate-Light (5-10 mph)	76	5	27.6	Routine
	10/19/2015	7:20	High Tide Falling	Clear	North-Northeast	Moderate (10-15 mph)	70	75	28.5	Routine
	10/26/2015	7:30	Low Tide	Cloudy	North-Northwest	Strong (20-35 mph)	70	207	19.4	Routine
Cypremort Point State Park										
<i>CYPT1</i>	<i>Beach Name Cypremort Point State Park</i>									
	4/13/2015	7:35	High Tide	Rain	Southwest	Moderate (10-15 mph)	72	42	1.2	Routine
	4/20/2015	7:20	High Tide	Scattered Clouds	West-Northwest	Moderate-Light (5-10 mph)	72	5	0.7	Routine
	4/27/2015	7:20	High Tide	Cloudy	West-Southwest	Moderate-Light (5-10 mph)	76	64	0.5	Routine
	5/4/2015	7:15	High Tide Falling	Clear	East	Light (0-5 mph)	73	5	0.7	Routine
	5/11/2015	7:20	High Tide	Cloudy	South-Southeast	Moderate-Light (5-10 mph)	78	831	0.5	Routine
	5/18/2015	7:25	High Tide	Partly Cloudy	South-Southeast	Light (0-5 mph)	78	31	0.4	Routine
	5/26/2015	7:25	High Tide Falling	Cloudy	North-Northeast	Moderate-Light (5-10 mph)	76	53	0.4	Routine
	6/1/2015	7:20	Low Tide Falling	Partly Cloudy	North-Northwest	Light (0-5 mph)	80	31	0.5	Routine
	6/8/2015	7:25	Low Tide Falling	Partly Cloudy	Calm	Calm (0 mph)	81	64	0.5	Routine
	6/8/2015	7:25	Low Tide Falling	Partly Cloudy	Calm	Calm (0 mph)	81	31	0.5	Field Duplicate
	6/15/2015	7:20	High Tide Falling	Partly Cloudy	South-Southeast	Light (0-5 mph)	82	5	0.3	Routine
	6/22/2015	7:25	High Tide Falling	Scattered Clouds	South	Light (0-5 mph)	85	20	0.5	Routine
	6/29/2015	7:25	High Tide Falling	Cloudy	West-Southwest	Moderate-Light (5-10 mph)	80	53	0.5	Routine
	7/6/2015	7:20	High Tide Falling	Cloudy	South-Southwest	Light (0-5 mph)	80	10	0.4	Routine
	7/13/2015	7:20	High Tide	Clear	West	Moderate-Light (5-10 mph)	84	42	0.4	Routine
	7/20/2015	7:20	High Tide Falling	Partly Cloudy	Northwest	Moderate-Light (5-10 mph)	85	20	0.7	Routine
	7/27/2015	7:25	High Tide Falling	Scattered Clouds	Northwest	Light (0-5 mph)	85	5	8.8	Routine
	8/3/2015	7:20	High Tide Falling	Clear	South-Southwest	Light (0-5 mph)	84	31	11.1	Routine
	8/10/2015	7:20	High Tide	Clear	East-Northeast	Moderate-Light (5-10 mph)	83	429	8.9	Routine
	8/17/2015	7:25	High Tide	Light Rain	West	Light (0-5 mph)	82	2006	14.6	Routine
	8/24/2015	7:25	High Tide	Clear	West	Moderate-Light (5-10 mph)	85	504	10.6	Routine
	8/31/2015	7:25	High Tide	Scattered Clouds	Calm	Calm (0 mph)	80	150	9.9	Routine
	8/31/2015	7:25	High Tide	Scattered Clouds	Calm	Calm (0 mph)	80	64	9.9	Field Split
	9/8/2015	7:25	High Tide	Cloudy	North	Light (0-5 mph)	81	99	10.4	Routine
	9/14/2015	7:20	High Tide Falling	Clear	East-Northeast	Light (0-5 mph)	72	20	9.4	Routine
	9/21/2015	7:20	High Tide	Cloudy	North	Moderate-Light (5-10 mph)	80	31	9.0	Routine
	9/28/2015	7:20	High Tide	Cloudy	Northeast	Moderate (10-15 mph)	75	271	8.7	Routine

Beach Station ID	Date	Time	Tide	Weather	Wind Direction	Wind Speed	Water Temp	Entero- cocci	Salinity	Sample Type
	10/5/2015	7:25	High Tide	Scattered Clouds	North	Light (0-5 mph)	64	10	7.7	Routine
	10/12/2015	7:20	High Tide	Cloudy	South-Southeast	Light (0-5 mph)	70	364	8.3	Routine
	10/19/2015	7:25	High Tide Falling	Scattered Clouds	East-Northeast	Moderate-Light (5-10 mph)	64	31	9.7	Routine
	10/26/2015	8:10	High Tide	Light Rain	South-Southwest	Moderate-Light (5-10 mph)	70	99	8.3	Routine
Elmer's Island										
<i>ELMRI</i>	<i>Beach Name Elmer's Island - 1</i>									
	4/7/2015	6:31	High Tide Rising	Cloudy	East-Southeast	Moderate-Light (5-10 mph)	74	5	14.6	Routine
	4/14/2015	6:45	Low Tide	Cloudy	South-Southeast	Moderate (10-15 mph)	75	10	11.1	Routine
	4/21/2015	6:30	Low Tide Falling	Cloudy	Northeast	Moderate (10-15 mph)	66	5	18.5	Routine
	4/28/2015	6:33	Normal	Cloudy	East	Moderate (10-15 mph)	72	64	14.2	Routine
	5/12/2015	6:31	Normal	Scattered Clouds	Southeast	Moderate-Light (5-10 mph)	82	5	13.9	Field Duplicate
	5/12/2015	6:31	Normal	Scattered Clouds	Southeast	Moderate-Light (5-10 mph)	82	20	14.0	Routine
	5/19/2015	6:24	High Tide Rising	Partly Cloudy	East-Southeast	Light (0-5 mph)	80	5	11.7	Routine
	5/26/2015	6:43	Normal	Rain	North	Moderate-Strong (15-20 mph)	76	31	19.4	Routine
	6/2/2015	6:30	High Tide Rising	Partly Cloudy	West	Light (0-5 mph)	78	10	22.5	Routine
	6/9/2015	6:12	Low Tide	Cloudy	Calm	Calm (0 mph)	84	20	17.7	Routine
	6/16/2015	6:00	Extremely High Tide	Scattered Clouds	East-Southeast	Moderate-Light (5-10 mph)	84	5	15.1	Routine
	6/23/2015	6:05	Low Tide Falling	Clear	South-Southeast	Calm (0 mph)	86	5	17.3	Routine
	6/30/2015	6:05	Low Tide Falling		Southwest	Light (0-5 mph)	86	10	35.0	Routine
	7/7/2015	6:46	High Tide Falling	Partly Cloudy	Southeast	Moderate-Light (5-10 mph)	85	5	20.7	Routine
	7/14/2015	6:17	High Tide Rising	Partly Cloudy	West	Moderate-Light (5-10 mph)	86	74	25.9	Routine
	7/14/2015	6:17	High Tide Rising	Partly Cloudy	West	Moderate-Light (5-10 mph)	86	5	26.3	Field Duplicate
	7/21/2015	6:32	Normal	Partly Cloudy	West	Light (0-5 mph)	86	31	30.1	Routine
	7/28/2015	6:28	High Tide	Partly Cloudy	Calm	Calm (0 mph)	86	10	15.1	Routine
	8/4/2015	6:15	Normal	Rain	South	Light (0-5 mph)	86	124	26.4	Routine
	8/11/2015	6:22	High Tide Rising	Partly Cloudy	Calm	Calm (0 mph)	88	164	28.9	Routine
	8/18/2015	6:40	Normal	Cloudy	South	Light (0-5 mph)	85	10	21.5	Routine
	8/25/2015	7:10	High Tide	Clear	Northeast	Moderate-Light (5-10 mph)	86	20	21.7	Routine
	9/1/2015	7:18	Low Tide	Partly Cloudy	East	Light (0-5 mph)	86	5	21.2	Routine
	9/8/2015	7:26	High Tide Rising	Partly Cloudy	East	Light (0-5 mph)	86	20	23.1	Routine
	9/8/2015	7:26	High Tide Rising	Partly Cloudy	East	Light (0-5 mph)	86	10	23.1	Field Duplicate
	9/15/2015	7:31	Normal	Cloudy	Southeast	Moderate-Light (5-10 mph)	78	5	22.2	Routine
	9/29/2015	7:31	Low Tide Falling	Partly Cloudy	Calm	Calm (0 mph)	82	20	27.6	Routine

Beach Station ID	Date	Time	Tide	Weather	Wind Direction	Wind Speed	Water Temp	Entero- cocci	Salinity	Sample Type
	10/6/2015	7:17	High Tide	Scattered Clouds	North	Light (0-5 mph)	75	5	31.4	Routine
	10/13/2015	7:24	Normal	Clear	South-Southwest	Light (0-5 mph)	76	64	31.5	Routine
	10/20/2015	7:05	High Tide Falling	Partly Cloudy	East	Moderate-Light (5-10 mph)	76	20	32.2	Routine
	10/27/2015	7:15	Low Tide Falling	Partly Cloudy	West	Moderate-Light (5-10 mph)		20	31.4	Routine
Fontainebleau State Park										
<i>FNTB1</i>	<i>Beach Name Fontainebleau State Park</i>									
	4/7/2015	6:31	High Tide Rising	Cloudy	East-Southeast	Moderate-Light (5-10 mph)	75.2	5	2.7	Routine
	4/15/2015	12:25	High Tide Falling	Scattered Clouds	North-Northeast	Light (0-5 mph)	79.3	137	2.0	Routine
	4/21/2015	11:07	Low Tide	Clear	South-Southwest	Light (0-5 mph)	74.8	5		Routine
	4/28/2015	11:15	High Tide Falling	Cloudy	East	Light (0-5 mph)	71.1	64	0.6	Routine
	5/5/2015	10:15	Low Tide Falling	Partly Cloudy	Calm	Calm (0 mph)	84	20	1.3	Routine
	5/12/2015	11:28	Low Tide	Cloudy	Calm	Calm (0 mph)	81.8	10	1.4	Field Split
	5/12/2015	11:28	Low Tide	Cloudy	Calm	Calm (0 mph)	81.8	20	1.4	Routine
	5/19/2015	11:06	Low Tide Falling	Scattered Clouds	Northeast	Light (0-5 mph)	84.4	10	1.7	Routine
	5/19/2015	11:06	Low Tide Falling	Scattered Clouds	Northeast	Light (0-5 mph)	84.4	10	1.7	Field Duplicate
	5/26/2015	11:35	Low Tide Falling	Cloudy	Calm	Calm (0 mph)	73.8	75	1.4	Routine
	6/2/2015	11:05	Low Tide Falling	Scattered Clouds	Calm	Calm (0 mph)	86.4	10	1.6	Routine
	6/9/2015	11:22	Low Tide Falling	Light Rain	Calm	Calm (0 mph)	86	271	1.7	Routine
	6/16/2015	11:05	High Tide	Partly Cloudy	East-Northeast	Light (0-5 mph)	85.46	504	1.9	Routine
	6/23/2015	11:00	Low Tide	Scattered Clouds	North-Northeast	Light (0-5 mph)	87	10	0.9	Routine
	6/30/2015	10:59	Extremely Low Tide	Partly Cloudy	Southwest	Light (0-5 mph)	86	20	0.5	Routine
	7/7/2015	11:10	Low Tide Falling	Scattered Clouds	North-Northeast	Light (0-5 mph)	89.24	1652	0.8	Routine
	7/14/2015	11:05	Extremely Low Tide	Clear	Calm	Calm (0 mph)	86	10	0.9	Field Split
	7/14/2015	11:05	Extremely Low Tide	Clear	Calm	Calm (0 mph)	86	5	0.9	Routine
	7/21/2015	11:02	Low Tide Falling	Clear	Calm	Calm (0 mph)	84	110	0.6	Routine
	7/28/2015	10:55	Low Tide Falling	Clear	Calm	Calm (0 mph)	86	192	0.7	Routine
	8/5/2015	10:15	Low Tide Falling	Partly Cloudy	Calm	Calm (0 mph)	82	20	1.3	Routine
	8/11/2015	12:00	Low Tide Falling	Scattered Clouds	Calm	Calm (0 mph)	88	64	0.9	Routine
	8/18/2015	12:30	Low Tide Falling	Partly Cloudy	Calm	Calm (0 mph)	86	164	1.2	Routine
	8/25/2015	12:40	High Tide	Clear	Southeast	Light (0-5 mph)	86	111	3.9	Routine
	9/1/2015	12:15	Normal	Clear	Northwest	Light (0-5 mph)	86	5	3.4	Routine
	9/8/2015	12:05	Normal	Partly Cloudy	East-Southeast	Light (0-5 mph)	86	10	2.6	Routine
	9/15/2015	12:18	High Tide Falling	Partly Cloudy	West	Light (0-5 mph)	80	5	2.1	Routine

Beach Station ID											
	Date	Time	Tide	Weather	Wind Direction	Wind Speed	Water Temp	Entero- cocci	Salinity	Sample Type	
	9/22/2015	12:05	High Tide	Falling	Clear	North-Northeast	Light (0-5 mph)	79	5	1.8	Routine
	9/29/2015	11:58	High Tide	Falling	Cloudy	West	Light (0-5 mph)	80	20	2.4	Routine
	10/6/2015	11:59	High Tide	Rising	Clear	West	Light (0-5 mph)	77.9	10	5.2	Routine
	10/13/2015	12:05	High Tide	Falling	Cloudy	North-Northeast	Moderate-Light (5-10 mph)	76	64	4.2	Routine
	10/20/2015	12:12	High Tide		Cloudy	East-Southeast	Moderate-Light (5-10 mph)	69.8	10	3.1	Routine
	10/27/2015	12:50	Extremely High Tide		Cloudy	North	Light (0-5 mph)	73.2	2006	7.0	Routine

Grand Isle Beach*GIB1**Beach Name Grand Isle Beach - 1*

4/7/2015	6:31	High Tide	Rising	Cloudy	East-Southeast	Moderate-Light (5-10 mph)	72	87	13.6	Routine
4/14/2015	6:45	Low Tide		Cloudy	South-Southeast	Moderate (10-15 mph)	76	5	8.8	Routine
4/21/2015	6:30	Low Tide	Falling	Cloudy	Northeast	Moderate (10-15 mph)	68	10	16.0	Routine
4/28/2015	6:33	Normal		Cloudy	East	Moderate (10-15 mph)	72	53	18.9	Routine
5/12/2015	6:31	Normal		Scattered Clouds	Southeast	Moderate-Light (5-10 mph)	82	5	10.8	Routine
5/19/2015	6:24	High Tide	Rising	Partly Cloudy	East-Southeast	Light (0-5 mph)	80	20	6.1	Routine
5/26/2015	6:43	Normal		Rain	North	Moderate-Strong (15-20 mph)	76	20	15.4	Routine
6/2/2015	6:30	High Tide	Rising	Partly Cloudy	West	Light (0-5 mph)	80	10	14.5	Routine
6/9/2015	6:12	Low Tide		Cloudy	Calm	Calm (0 mph)	86	53	15.6	Routine
6/23/2015	6:05	Low Tide	Falling	Clear	South-Southeast	Calm (0 mph)	86	10	12.9	Field Duplicate
6/23/2015	6:05	Low Tide	Falling	Clear	South-Southeast	Calm (0 mph)	86	31	12.7	Routine
6/30/2015	6:05	Low Tide	Falling		Southwest	Light (0-5 mph)	86	87	35.0	Routine
7/7/2015	6:46	High Tide	Falling	Partly Cloudy	Southeast	Moderate-Light (5-10 mph)	86	10	16.5	Routine
7/14/2015	6:17	High Tide	Rising	Partly Cloudy	West	Moderate-Light (5-10 mph)	86	41	25.3	Routine
7/21/2015	6:32	Normal		Partly Cloudy	West	Light (0-5 mph)	86	5	29.3	Routine
7/28/2015	6:28	High Tide		Partly Cloudy	Calm	Calm (0 mph)	87	20	8.1	Routine
8/4/2015	6:15	Normal		Rain	South	Light (0-5 mph)	86	31	23.4	Routine
8/11/2015	6:22	High Tide	Rising	Partly Cloudy	Calm	Calm (0 mph)	88	10	21.2	Routine
8/18/2015	6:40	Normal		Cloudy	South	Light (0-5 mph)	86	20	19.9	Routine
8/25/2015	7:10	High Tide		Clear	Northeast	Moderate-Light (5-10 mph)	86	75	19.5	Field Duplicate
8/25/2015	7:10	High Tide		Clear	Northeast	Moderate-Light (5-10 mph)	86	53	19.5	Routine
9/1/2015	7:18	Low Tide		Partly Cloudy	East	Light (0-5 mph)	86	10	21.2	Routine
9/8/2015	7:26	High Tide	Rising	Partly Cloudy	East	Light (0-5 mph)	86	5	23.9	Routine
9/15/2015	7:31	Normal		Cloudy	Southeast	Moderate-Light (5-10 mph)	79	31	31.1	Routine
9/22/2015	7:23	High Tide		Scattered Clouds	Northeast	Moderate (10-15 mph)	79	5	26.4	Routine

Beach Station ID	Date	Time	Tide	Weather	Wind Direction	Wind Speed	Water Temp	Entero- cocci	Salinity	Sample Type	
	9/29/2015	7:31	Low Tide	Falling	Partly Cloudy	Calm	Calm (0 mph)	82	10	27.7	Routine
	10/6/2015	7:17	High Tide		Scattered Clouds	North	Light (0-5 mph)	76	5	31.3	Routine
	10/13/2015	7:24	Normal		Clear	South-Southwest	Light (0-5 mph)	76	5	31.3	Routine
	10/20/2015	7:05	High Tide	Falling	Partly Cloudy	East	Moderate-Light (5-10 mph)	76	31	32.7	Routine
	10/27/2015	7:15	Low Tide	Falling	Partly Cloudy	West	Moderate-Light (5-10 mph)		20	31.3	Routine
Grand Isle Beach											
GIB2	Beach Name Grand Isle Beach - 2										
	4/7/2015	6:31	High Tide	Rising	Cloudy	East-Southeast	Moderate-Light (5-10 mph)	72	10	14.1	Routine
	4/14/2015	6:45	Low Tide		Cloudy	South-Southeast	Moderate (10-15 mph)	76	5	8.9	Routine
	4/21/2015	6:30	Low Tide	Falling	Cloudy	Northeast	Moderate (10-15 mph)	67	10	16.1	Routine
	4/28/2015	6:33	Normal		Cloudy	East	Moderate (10-15 mph)	72	75	17.1	Routine
	5/12/2015	6:31	Normal		Scattered Clouds	Southeast	Moderate-Light (5-10 mph)	82	5	10.9	Routine
	5/19/2015	6:24	High Tide	Rising	Partly Cloudy	East-Southeast	Light (0-5 mph)	80	5	9.8	Routine
	5/26/2015	6:43	Normal		Rain	North	Moderate-Strong (15-20 mph)	76	1091	15.3	Routine
	6/2/2015	6:30	High Tide	Rising	Partly Cloudy	West	Light (0-5 mph)	81	5	14.6	Routine
	6/9/2015	6:12	Low Tide		Cloudy	Calm	Calm (0 mph)	84	10	15.6	Routine
	6/16/2015	6:00	Extremely High Tide		Scattered Clouds	East-Southeast	Moderate-Light (5-10 mph)	86	10	9.1	Routine
	6/16/2015	6:00	Extremely High Tide		Scattered Clouds	East-Southeast	Moderate-Light (5-10 mph)	86	20	9.1	Field Split
	6/23/2015	6:05	Low Tide	Falling	Clear	South-Southeast	Calm (0 mph)	86	5	17.5	Routine
	6/30/2015	6:05	Low Tide	Falling		Southwest	Light (0-5 mph)	86	150	35.0	Field Split
	6/30/2015	6:05	Low Tide	Falling		Southwest	Light (0-5 mph)	86	124	35.0	Routine
	7/7/2015	6:46	High Tide	Falling	Partly Cloudy	Southeast	Moderate-Light (5-10 mph)	86	10	17.2	Routine
	7/14/2015	6:17	High Tide	Rising	Partly Cloudy	West	Moderate-Light (5-10 mph)	86	52	26.8	Routine
	7/21/2015	6:32	Normal		Partly Cloudy	West	Light (0-5 mph)	86	72	29.6	Routine
	7/28/2015	6:28	High Tide		Partly Cloudy	Calm	Calm (0 mph)	87	137	8.7	Routine
	8/4/2015	6:15	Normal		Rain	South	Light (0-5 mph)	86	384	22.8	Routine
	8/11/2015	6:22	High Tide	Rising	Partly Cloudy	Calm	Calm (0 mph)	88	10	22.5	Routine
	8/18/2015	6:40	Normal		Cloudy	South	Light (0-5 mph)	86	10	20.3	Routine
	8/25/2015	7:10	High Tide		Clear	Northeast	Moderate-Light (5-10 mph)	86	10	20.0	Routine
	9/1/2015	7:18	Low Tide		Partly Cloudy	East	Light (0-5 mph)	86	5	21.5	Field Split
	9/1/2015	7:18	Low Tide		Partly Cloudy	East	Light (0-5 mph)	86	5	21.4	Routine
	9/8/2015	7:26	High Tide	Rising	Partly Cloudy	East	Light (0-5 mph)	86	53	23.6	Routine
	9/15/2015	7:31	Normal		Cloudy	Southeast	Moderate-Light (5-10 mph)	79	64	30.8	Routine

Beach Station ID	Date	Time	Tide	Weather	Wind Direction	Wind Speed	Water Temp	Entero- cocci	Salinity	Sample Type
	9/22/2015	7:23	High Tide	Scattered Clouds	Northeast	Moderate (10-15 mph)	79	5	26.7	Routine
	9/29/2015	7:31	Low Tide Falling	Partly Cloudy	Calm	Calm (0 mph)	82	5	27.7	Routine
	10/6/2015	7:17	High Tide	Scattered Clouds	North	Light (0-5 mph)	76	5	31.3	Field Duplicate
	10/6/2015	7:17	High Tide	Scattered Clouds	North	Light (0-5 mph)	76	5	31.2	Routine
	10/13/2015	7:24	Normal	Clear	South-Southwest	Light (0-5 mph)	76	10	31.7	Routine
	10/20/2015	7:05	High Tide Falling	Partly Cloudy	East	Moderate-Light (5-10 mph)	76	5	32.8	Routine
	10/27/2015	7:15	Low Tide Falling	Partly Cloudy	West	Moderate-Light (5-10 mph)		5	32.4	Routine

Grand Isle Beach*GIB3**Beach Name Grand Isle Beach - 3*

4/7/2015	6:31	High Tide Rising	Cloudy	East-Southeast	Moderate-Light (5-10 mph)	72	5	14.2	Routine
4/14/2015	6:45	Low Tide	Cloudy	South-Southeast	Moderate (10-15 mph)	76	5	9.3	Routine
4/21/2015	6:30	Low Tide Falling	Cloudy	Northeast	Moderate (10-15 mph)	66	5	16.5	Routine
4/28/2015	6:33	Normal	Cloudy	East	Moderate (10-15 mph)	72	99	16.7	Routine
5/12/2015	6:31	Normal	Scattered Clouds	Southeast	Moderate-Light (5-10 mph)	82	5	11.3	Routine
5/19/2015	6:24	High Tide Rising	Partly Cloudy	East-Southeast	Light (0-5 mph)	80	20	9.9	Routine
5/26/2015	6:43	Normal	Rain	North	Moderate-Strong (15-20 mph)	76	53	15.5	Routine
5/26/2015	6:43	Normal	Rain	North	Moderate-Strong (15-20 mph)	76	87	15.4	Field Duplicate
6/2/2015	6:30	High Tide Rising	Partly Cloudy	West	Light (0-5 mph)	82	20	15.3	Field Split
6/2/2015	6:30	High Tide Rising	Partly Cloudy	West	Light (0-5 mph)	82	10	15.3	Routine
6/9/2015	6:12	Low Tide	Cloudy	Calm	Calm (0 mph)	85	20	18.0	Routine
6/16/2015	6:00	Extremely High Tide	Scattered Clouds	East-Southeast	Moderate-Light (5-10 mph)	86	31	9.2	Routine
6/23/2015	6:05	Low Tide Falling	Clear	South-Southeast	Calm (0 mph)	86	5	17.4	Routine
6/30/2015	6:05	Low Tide Falling		Southwest	Light (0-5 mph)	86	42	35.0	Routine
7/7/2015	6:46	High Tide Falling	Partly Cloudy	Southeast	Moderate-Light (5-10 mph)	85	5	15.7	Routine
7/14/2015	6:17	High Tide Rising	Partly Cloudy	West	Moderate-Light (5-10 mph)	86	31	27.4	Routine
7/21/2015	6:32	Normal	Partly Cloudy	West	Light (0-5 mph)	86	10	30.1	Routine
7/28/2015	6:28	High Tide	Partly Cloudy	Calm	Calm (0 mph)	86	87	10.4	Routine
8/4/2015	6:15	Normal	Rain	South	Light (0-5 mph)	86	697	23.8	Routine
8/11/2015	6:22	High Tide Rising	Partly Cloudy	Calm	Calm (0 mph)	88	178	23.6	Routine
8/18/2015	6:40	Normal	Cloudy	South	Light (0-5 mph)	86	5	20.8	Routine
8/25/2015	7:10	High Tide	Clear	Northeast	Moderate-Light (5-10 mph)	86	31	20.1	Routine
9/1/2015	7:18	Low Tide	Partly Cloudy	East	Light (0-5 mph)	86	20	21.8	Routine
9/8/2015	7:26	High Tide Rising	Partly Cloudy	East	Light (0-5 mph)	86	31	23.9	Routine

Beach Station ID	Date	Time	Tide	Weather	Wind Direction	Wind Speed	Water Temp	Entero- cocci	Salinity	Sample Type
	9/15/2015	7:31	Normal	Cloudy	Southeast	Moderate-Light (5-10 mph)	78	10	26.1	Routine
	9/22/2015	7:23	High Tide	Scattered Clouds	Northeast	Moderate (10-15 mph)	78	10	27.1	Routine
	9/29/2015	7:31	Low Tide Falling	Partly Cloudy	Calm	Calm (0 mph)	81	10	27.8	Routine
	10/6/2015	7:17	High Tide	Scattered Clouds	North	Light (0-5 mph)	76	5	31.1	Routine
	10/13/2015	7:24	Normal	Clear	South-Southwest	Light (0-5 mph)	76	10	31.3	Routine
	10/20/2015	7:05	High Tide Falling	Partly Cloudy	East	Moderate-Light (5-10 mph)	76	20	32.7	Routine
	10/27/2015	7:15	Low Tide Falling	Partly Cloudy	West	Moderate-Light (5-10 mph)		20	32.0	Field Split
	10/27/2015	7:15	Low Tide Falling	Partly Cloudy	West	Moderate-Light (5-10 mph)		20	32.1	Routine

Grand Isle State Park

GISPI

Beach Name Grand Isle State Park - 1

4/7/2015	6:31	High Tide Rising	Cloudy	East-Southeast	Moderate-Light (5-10 mph)	72	5	12.0	Routine
4/14/2015	6:45	Low Tide	Cloudy	South-Southeast	Moderate (10-15 mph)	75	5	7.9	Routine
4/21/2015	6:30	Low Tide Falling	Cloudy	Northeast	Moderate (10-15 mph)	68	5	8.0	Routine
4/21/2015	6:30	Low Tide Falling	Cloudy	Northeast	Moderate (10-15 mph)	68	5	8.1	Field Split
4/28/2015	6:33	Normal	Cloudy	East	Moderate (10-15 mph)	72	64	15.9	Routine
5/12/2015	6:31	Normal	Scattered Clouds	Southeast	Moderate-Light (5-10 mph)	82	5	10.5	Routine
5/19/2015	6:24	High Tide Rising	Partly Cloudy	East-Southeast	Light (0-5 mph)	80	5	9.4	Routine
5/26/2015	6:43	Normal	Rain	North	Moderate-Strong (15-20 mph)	76	20	15.2	Routine
6/2/2015	6:30	High Tide Rising	Partly Cloudy	West	Light (0-5 mph)	84	20	14.3	Field Duplicate
6/2/2015	6:30	High Tide Rising	Partly Cloudy	West	Light (0-5 mph)	84	20	14.6	Routine
6/9/2015	6:12	Low Tide	Cloudy	Calm	Calm (0 mph)	86	10	14.3	Routine
6/16/2015	6:00	Extremely High Tide	Scattered Clouds	East-Southeast	Moderate-Light (5-10 mph)	86	10	8.8	Routine
6/23/2015	6:05	Low Tide Falling	Clear	South-Southeast	Calm (0 mph)	88	10	9.9	Field Duplicate
6/23/2015	6:05	Low Tide Falling	Clear	South-Southeast	Calm (0 mph)	86	5	9.2	Routine
6/30/2015	6:05	Low Tide Falling		Southwest	Light (0-5 mph)	86	53	34.1	Routine
7/7/2015	6:46	High Tide Falling	Partly Cloudy	Southeast	Moderate-Light (5-10 mph)	85	10	14.4	Routine
7/14/2015	6:17	High Tide Rising	Partly Cloudy	West	Moderate-Light (5-10 mph)	86	5	25.1	Routine
7/21/2015	6:32	Normal	Partly Cloudy	West	Light (0-5 mph)	86	10	26.9	Routine
7/28/2015	6:28	High Tide	Partly Cloudy	Calm	Calm (0 mph)	87	10	8.2	Routine
8/4/2015	6:15	Normal	Rain	South	Light (0-5 mph)	85	10	20.0	Routine
8/11/2015	6:22	High Tide Rising	Partly Cloudy	Calm	Calm (0 mph)	88	5	22.2	Routine
8/18/2015	6:40	Normal	Cloudy	South	Light (0-5 mph)	86	10	16.6	Routine
8/25/2015	7:10	High Tide	Clear	Northeast	Moderate-Light (5-10 mph)	86	75	19.3	Routine

Beach Station ID	Date	Time	Tide	Weather	Wind Direction	Wind Speed	Water Temp	Entero- cocci	Salinity	Sample Type
	9/1/2015	7:18	Low Tide	Partly Cloudy	East	Light (0-5 mph)	86	5	19.2	Routine
	9/8/2015	7:26	High Tide Rising	Partly Cloudy	East	Light (0-5 mph)	86	5	23.1	Routine
	9/8/2015	7:26	High Tide Rising	Partly Cloudy	East	Light (0-5 mph)	86	10	23.0	Field Duplicate
	9/15/2015	7:31	Normal	Cloudy	Southeast	Moderate-Light (5-10 mph)	82	10	29.8	Routine
	9/22/2015	7:23	High Tide	Scattered Clouds	Northeast	Moderate (10-15 mph)	79	10	24.2	Routine
	9/22/2015	7:23	High Tide	Scattered Clouds	Northeast	Moderate (10-15 mph)	79	10	24.8	Field Duplicate
	9/29/2015	7:31	Low Tide Falling	Partly Cloudy	Calm	Calm (0 mph)	81	5	27.6	Routine
	10/6/2015	7:17	High Tide	Scattered Clouds	North	Light (0-5 mph)	76	5	29.2	Field Duplicate
	10/6/2015	7:17	High Tide	Scattered Clouds	North	Light (0-5 mph)	76	10	28.8	Routine
	10/13/2015	7:24	Normal	Clear	South-Southwest	Light (0-5 mph)	76	5	31.0	Routine
	10/20/2015	7:05	High Tide Falling	Partly Cloudy	East	Moderate-Light (5-10 mph)	76	20	32.3	Field Split
	10/20/2015	7:05	High Tide Falling	Partly Cloudy	East	Moderate-Light (5-10 mph)	76	31	32.4	Routine
	10/27/2015	7:15	Low Tide Falling	Partly Cloudy	West	Moderate-Light (5-10 mph)		42	31.2	Routine

Grand Isle State Park*GISP2**Beach Name Grand Isle State Park - 2*

	4/7/2015	6:31	High Tide Rising	Cloudy	East-Southeast	Moderate-Light (5-10 mph)	72	20	12.9	Routine
	4/7/2015	6:31	High Tide Rising	Cloudy	East-Southeast	Moderate-Light (5-10 mph)	72	10	12.9	Field Duplicate
	4/14/2015	6:45	Low Tide	Cloudy	South-Southeast	Moderate (10-15 mph)	75	10	7.8	Routine
	4/14/2015	6:45	Low Tide	Cloudy	South-Southeast	Moderate (10-15 mph)	75	5	8.0	Field Split
	4/21/2015	6:30	Low Tide Falling	Cloudy	Northeast	Moderate (10-15 mph)	68	20	8.1	Routine
	4/28/2015	6:33	Normal	Cloudy	East	Moderate (10-15 mph)	72	504	16.3	Routine
	5/12/2015	6:31	Normal	Scattered Clouds	Southeast	Moderate-Light (5-10 mph)	82	5	10.6	Routine
	5/19/2015	6:24	High Tide Rising	Partly Cloudy	East-Southeast	Light (0-5 mph)	80	20	9.5	Routine
	5/19/2015	6:24	High Tide Rising	Partly Cloudy	East-Southeast	Light (0-5 mph)	80	31	9.5	Field Duplicate
	5/26/2015	6:43	Normal	Rain	North	Moderate-Strong (15-20 mph)	76	20	15.2	Routine
	6/2/2015	6:30	High Tide Rising	Partly Cloudy	West	Light (0-5 mph)	80	5	14.2	Routine
	6/9/2015	6:12	Low Tide	Cloudy	Calm	Calm (0 mph)	85	42	14.1	Routine
	6/16/2015	6:00	Extremely High Tide	Scattered Clouds	East-Southeast	Moderate-Light (5-10 mph)	86	10	9.0	Routine
	6/23/2015	6:05	Low Tide Falling	Clear	South-Southeast	Calm (0 mph)	86	20	11.3	Field Split
	6/23/2015	6:05	Low Tide Falling	Clear	South-Southeast	Calm (0 mph)	88	10	11.2	Routine
	6/30/2015	6:05	Low Tide Falling		Southwest	Light (0-5 mph)	86	64	34.7	Routine
	7/7/2015	6:46	High Tide Falling	Partly Cloudy	Southeast	Moderate-Light (5-10 mph)	85	5	14.6	Routine
	7/14/2015	6:17	High Tide Rising	Partly Cloudy	West	Moderate-Light (5-10 mph)	86	51	25.5	Routine

Beach Station ID	Date	Time	Tide	Weather	Wind Direction	Wind Speed	Water Temp	Entero- cocci	Salinity	Sample Type
	7/21/2015	6:32	Normal	Partly Cloudy	West	Light (0-5 mph)	86	5	28.5	Routine
	7/28/2015	6:28	High Tide	Partly Cloudy	Calm	Calm (0 mph)	87	20	8.2	Routine
	8/4/2015	6:15	Normal	Rain	South	Light (0-5 mph)	85	164	22.1	Routine
	8/11/2015	6:22	High Tide Rising	Partly Cloudy	Calm	Calm (0 mph)	88	31	21.7	Routine
	8/18/2015	6:40	Normal	Cloudy	South	Light (0-5 mph)	86	20	16.6	Routine
	8/25/2015	7:10	High Tide	Clear	Northeast	Moderate-Light (5-10 mph)	86	64	20.0	Routine
	9/1/2015	7:18	Low Tide	Partly Cloudy	East	Light (0-5 mph)	86	20	19.2	Routine
	9/8/2015	7:26	High Tide Rising	Partly Cloudy	East	Light (0-5 mph)	86	5	23.1	Routine
	9/15/2015	7:31	Normal	Cloudy	Southeast	Moderate-Light (5-10 mph)	82	5	31.0	Routine
	9/22/2015	7:23	High Tide	Scattered Clouds	Northeast	Moderate (10-15 mph)	79	10	25.1	Routine
	9/29/2015	7:31	Low Tide Falling	Partly Cloudy	Calm	Calm (0 mph)	81	5	27.6	Routine
	10/6/2015	7:17	High Tide	Scattered Clouds	North	Light (0-5 mph)	76	5	30.9	Routine
	10/13/2015	7:24	Normal	Clear	South-Southwest	Light (0-5 mph)	76	10	30.9	Routine
	10/20/2015	7:05	High Tide Falling	Partly Cloudy	East	Moderate-Light (5-10 mph)	76	10	32.5	Routine
	10/27/2015	7:15	Low Tide Falling	Partly Cloudy	West	Moderate-Light (5-10 mph)		5	31.7	Routine

Grand Isle State Park*GISP3**Beach Name Grand Isle State Park - 3*

	4/7/2015	6:31	High Tide Rising	Cloudy	East-Southeast	Moderate-Light (5-10 mph)	72	5	13.0	Routine
	4/14/2015	6:45	Low Tide	Cloudy	South-Southeast	Moderate (10-15 mph)	75	20	8.1	Routine
	4/14/2015	6:45	Low Tide	Cloudy	South-Southeast	Moderate (10-15 mph)	75	5	8.1	Field Duplicate
	4/21/2015	6:30	Low Tide Falling	Cloudy	Northeast	Moderate (10-15 mph)	68	5	9.4	Field Split
	4/21/2015	6:30	Low Tide Falling	Cloudy	Northeast	Moderate (10-15 mph)	68	10	9.1	Routine
	4/28/2015	6:33	Normal	Cloudy	East	Moderate (10-15 mph)	72	306	17.0	Routine
	5/12/2015	6:31	Normal	Scattered Clouds	Southeast	Moderate-Light (5-10 mph)	82	5	10.6	Routine
	5/19/2015	6:24	High Tide Rising	Partly Cloudy	East-Southeast	Light (0-5 mph)	80	10	9.5	Routine
	5/26/2015	6:43	Normal	Rain	North	Moderate-Strong (15-20 mph)	76	20	15.2	Routine
	6/2/2015	6:30	High Tide Rising	Partly Cloudy	West	Light (0-5 mph)	80	20	14.0	Routine
	6/9/2015	6:12	Low Tide	Cloudy	Calm	Calm (0 mph)	85	53	14.3	Routine
	6/9/2015	6:12	Low Tide	Cloudy	Calm	Calm (0 mph)	85	53	14.3	Field Split
	6/16/2015	6:00	Extremely High Tide	Scattered Clouds	East-Southeast	Moderate-Light (5-10 mph)	86	5	9.1	Routine
	6/23/2015	6:05	Low Tide Falling	Clear	South-Southeast	Calm (0 mph)	86	42	13.0	Routine
	6/30/2015	6:05	Low Tide Falling		Southwest	Light (0-5 mph)	87	531	34.8	Routine
	7/7/2015	6:46	High Tide Falling	Partly Cloudy	Southeast	Moderate-Light (5-10 mph)	85	20	14.9	Routine

Beach Station ID	Date	Time	Tide	Weather	Wind Direction	Wind Speed	Water Temp	Entero- cocci	Salinity	Sample Type
	7/14/2015	6:17	High Tide Rising	Partly Cloudy	West	Moderate-Light (5-10 mph)	86	20	25.3	Routine
	7/21/2015	6:32	Normal	Partly Cloudy	West	Light (0-5 mph)	86	5	28.6	Routine
	7/28/2015	6:28	High Tide	Partly Cloudy	Calm	Calm (0 mph)	87	75	8.4	Routine
	8/4/2015	6:15	Normal	Rain	South	Light (0-5 mph)	85	64	22.0	Routine
	8/11/2015	6:22	High Tide Rising	Partly Cloudy	Calm	Calm (0 mph)	88	5	21.0	Routine
	8/18/2015	6:40	Normal	Cloudy	South	Light (0-5 mph)	86	20	19.9	Routine
	8/25/2015	7:10	High Tide	Clear	Northeast	Moderate-Light (5-10 mph)	86	87	19.9	Routine
	9/1/2015	7:18	Low Tide	Partly Cloudy	East	Light (0-5 mph)	86	5	19.2	Routine
	9/8/2015	7:26	High Tide Rising	Partly Cloudy	East	Light (0-5 mph)	86	5	23.1	Routine
	9/15/2015	7:31	Normal	Cloudy	Southeast	Moderate-Light (5-10 mph)	82	42	31.5	Routine
	9/22/2015	7:23	High Tide	Scattered Clouds	Northeast	Moderate (10-15 mph)	79	238	25.1	Routine
	9/29/2015	7:31	Low Tide Falling	Partly Cloudy	Calm	Calm (0 mph)	81	5	27.7	Routine
	10/6/2015	7:17	High Tide	Scattered Clouds	North	Light (0-5 mph)	76	5	31.1	Routine
	10/13/2015	7:24	Normal	Clear	South-Southwest	Light (0-5 mph)	76	64	30.8	Routine
	10/20/2015	7:05	High Tide Falling	Partly Cloudy	East	Moderate-Light (5-10 mph)	76	20	32.7	Routine
	10/27/2015	7:15	Low Tide Falling	Partly Cloudy	West	Moderate-Light (5-10 mph)		5	31.9	Routine

Grand Isle State Park*GISP4**Beach Name Grand Isle State Park - 4*

	4/7/2015	6:31	High Tide Rising	Cloudy	East-Southeast	Moderate-Light (5-10 mph)	72	10	13.5	Routine
	4/14/2015	6:45	Low Tide	Cloudy	South-Southeast	Moderate (10-15 mph)	75	10	8.0	Routine
	4/21/2015	6:30	Low Tide Falling	Cloudy	Northeast	Moderate (10-15 mph)	68	20	10.1	Routine
	4/28/2015	6:33	Normal	Cloudy	East	Moderate (10-15 mph)	72	150	16.7	Routine
	4/28/2015	6:33	Normal	Cloudy	East	Moderate (10-15 mph)	72	254	16.7	Field Duplicate
	5/12/2015	6:31	Normal	Scattered Clouds	Southeast	Moderate-Light (5-10 mph)	82	5	10.6	Field Split
	5/12/2015	6:31	Normal	Scattered Clouds	Southeast	Moderate-Light (5-10 mph)	82	5	10.6	Routine
	5/19/2015	6:24	High Tide Rising	Partly Cloudy	East-Southeast	Light (0-5 mph)	80	10	9.5	Routine
	5/26/2015	6:43	Normal	Rain	North	Moderate-Strong (15-20 mph)	76	42	15.8	Routine
	6/2/2015	6:30	High Tide Rising	Partly Cloudy	West	Light (0-5 mph)	82	10	14.1	Routine
	6/2/2015	6:30	High Tide Rising	Partly Cloudy	West	Light (0-5 mph)	82	31	14.1	Field Split
	6/9/2015	6:12	Low Tide	Cloudy	Calm	Calm (0 mph)	84	53	14.2	Routine
	6/16/2015	6:00	Extremely High Tide	Scattered Clouds	East-Southeast	Moderate-Light (5-10 mph)	86	5	9.0	Routine
	6/23/2015	6:05	Low Tide Falling	Clear	South-Southeast	Calm (0 mph)	86	20	13.0	Routine
	6/30/2015	6:05	Low Tide Falling		Southwest	Light (0-5 mph)	86	659	34.7	Routine

Beach Station ID	Date	Time	Tide	Weather	Wind Direction	Wind Speed	Water Temp	Entero- cocci	Salinity	Sample Type	
	7/7/2015	6:46	High Tide	Falling	Partly Cloudy	Southeast	Moderate-Light (5-10 mph)	85	5	15.0	Routine
	7/14/2015	6:17	High Tide	Rising	Partly Cloudy	West	Moderate-Light (5-10 mph)	86	30	25.1	Routine
	7/21/2015	6:32	Normal		Partly Cloudy	West	Light (0-5 mph)	86	10	28.6	Routine
	7/28/2015	6:28	High Tide		Partly Cloudy	Calm	Calm (0 mph)	87	5	7.8	Routine
	8/4/2015	6:15	Normal		Rain	South	Light (0-5 mph)	85	75	22.2	Routine
	8/11/2015	6:22	High Tide	Rising	Partly Cloudy	Calm	Calm (0 mph)	87	5	19.9	Routine
	8/18/2015	6:40	Normal		Cloudy	South	Light (0-5 mph)	86	5	20.1	Routine
	8/25/2015	7:10	High Tide		Clear	Northeast	Moderate-Light (5-10 mph)	86	20	20.6	Routine
	9/1/2015	7:18	Low Tide		Partly Cloudy	East	Light (0-5 mph)	86	5	19.3	Routine
	9/8/2015	7:26	High Tide	Rising	Partly Cloudy	East	Light (0-5 mph)	86	5	23.0	Routine
	9/15/2015	7:31	Normal		Cloudy	Southeast	Moderate-Light (5-10 mph)	82	10	31.4	Routine
	9/22/2015	7:23	High Tide		Scattered Clouds	Northeast	Moderate (10-15 mph)	79	10	25.1	Field Duplicate
	9/22/2015	7:23	High Tide		Scattered Clouds	Northeast	Moderate (10-15 mph)	79	5	24.9	Routine
	9/29/2015	7:31	Low Tide	Falling	Partly Cloudy	Calm	Calm (0 mph)	81	5	27.7	Routine
	10/6/2015	7:17	High Tide		Scattered Clouds	North	Light (0-5 mph)	76	10	31.1	Routine
	10/13/2015	7:24	Normal		Clear	South-Southwest	Light (0-5 mph)	76	31	31.0	Routine
	10/20/2015	7:05	High Tide	Falling	Partly Cloudy	East	Moderate-Light (5-10 mph)	76	5	32.5	Routine
	10/27/2015	7:15	Low Tide	Falling	Partly Cloudy	West	Moderate-Light (5-10 mph)		10	32.0	Routine

Gulf Breeze

GBRZI

Beach Name Gulf Breeze

	4/13/2015	6:50	Normal		Rain	South-Southeast	Moderate (10-15 mph)	73	42	15.3	Routine
	4/20/2015	7:00	High Tide		Scattered Clouds	Northwest	Moderate-Light (5-10 mph)	73	10	18.3	Routine
	4/27/2015	7:00	Low Tide	Falling	Rain	East-Southeast	Moderate-Strong (15-20 mph)	74	31	17.2	Routine
	4/27/2015	7:00	Low Tide	Falling	Rain	East-Southeast	Moderate-Strong (15-20 mph)	74	42	17.2	Field Duplicate
	5/4/2015	6:45	Normal		Scattered Clouds	Southeast	Moderate-Light (5-10 mph)	74	87	26.0	Routine
	5/12/2015	6:30	Normal		Cloudy	Northeast	Moderate-Light (5-10 mph)	75	31	9.0	Routine
	5/18/2015	6:45	Normal		Partly Cloudy	South-Southeast	Moderate-Light (5-10 mph)	80	42	11.5	Routine
	5/26/2015	7:00	Normal		Partly Cloudy	Southeast	Moderate-Strong (15-20 mph)	78	10	18.1	Routine
	6/1/2015	6:45	Normal		Scattered Clouds	North	Moderate-Light (5-10 mph)	82	10	18.6	Field Duplicate
	6/1/2015	6:45	Normal		Scattered Clouds	North	Moderate-Light (5-10 mph)	82	5	18.7	Routine
	6/8/2015	6:45	High Tide		Scattered Clouds	East-Northeast	Light (0-5 mph)	86	20	19.7	Routine
	6/15/2015	7:00	Normal		Partly Cloudy	South-Southeast	Moderate (10-15 mph)	84	697	18.8	Routine
	6/22/2015	6:45	High Tide		Partly Cloudy	South	Light (0-5 mph)	85	31	19.5	Routine

Beach Station ID	Date	Time	Tide	Weather	Wind Direction	Wind Speed	Water Temp	Entero- cocci	Salinity	Sample Type
	6/29/2015	7:00	Normal	Partly Cloudy	West	Moderate-Light (5-10 mph)	82	111	30.3	Routine
	7/6/2015	7:00	High Tide	Scattered Clouds	South	Moderate-Strong (15-20 mph)	86	75	30.6	Routine
	7/13/2015	7:00	Low Tide Falling	Scattered Clouds	West-Northwest	Light (0-5 mph)	86	10	17.1	Routine
	7/20/2015	7:00	High Tide Falling	Scattered Clouds	West	Moderate-Light (5-10 mph)	86	5	33.1	Routine
	7/27/2015	7:15	Low Tide Falling	Scattered Clouds	West-Northwest	Light (0-5 mph)	86	10	34.7	Routine
	8/3/2015	11:00	High Tide Falling	Scattered Clouds	East-Northeast	Light (0-5 mph)	86	10	35.0	Routine
	8/10/2015	7:00	Low Tide Falling	Scattered Clouds	West-Northwest	Moderate-Light (5-10 mph)	86	31	35.0	Routine
	8/17/2015	6:45	High Tide Rising	Light Rain	East-Southeast	Light (0-5 mph)	86	222	27.9	Routine
	8/24/2015	7:00	Normal	Scattered Clouds	Northwest	Moderate-Light (5-10 mph)	86	75	24.9	Routine
	8/24/2015	7:00	Normal	Scattered Clouds	Northwest	Moderate-Light (5-10 mph)	86	64	25.0	Field Split
	8/31/2015	7:00	Normal	Scattered Clouds	South-Southeast	Light (0-5 mph)	84	5	27.8	Routine
	9/8/2015	7:10	Normal	Partly Cloudy	East-Northeast	Light (0-5 mph)	85	20	26.1	Routine
	9/14/2015	7:00	Normal	Scattered Clouds	East-Northeast	Moderate-Light (5-10 mph)	78	31	26.8	Routine
	9/21/2015	7:20	Normal	Cloudy	Northeast	Moderate (10-15 mph)	83	53	26.4	Routine
	9/28/2015	7:15	Normal	Cloudy	East-Northeast	Moderate-Strong (15-20 mph)	80	64	25.3	Routine
	10/5/2015	7:15	Normal	Scattered Clouds	North	Moderate-Light (5-10 mph)	70	10	26.4	Routine
	10/12/2015	7:15	Normal	Scattered Clouds	South	Moderate-Light (5-10 mph)	76	20	27.6	Routine
	10/19/2015	7:20	High Tide Falling	Clear	North-Northeast	Moderate (10-15 mph)	70	20	28.5	Routine
	10/26/2015	7:30	Low Tide	Cloudy	North-Northwest	Strong (20-35 mph)	70	192	19.4	Routine

Holly Beach*HOLLYI**Beach Name Holly Beach - 1*

	4/13/2015	6:50	Normal	Rain	South-Southeast	Moderate (10-15 mph)	73	64	16.4	Routine
	4/20/2015	7:00	High Tide	Scattered Clouds	Northwest	Moderate-Light (5-10 mph)	73	31	18.2	Routine
	4/20/2015	7:00	High Tide	Scattered Clouds	Northwest	Moderate-Light (5-10 mph)	73	10	18.2	Field Duplicate
	4/27/2015	7:00	Low Tide Falling	Rain	East-Southeast	Moderate-Strong (15-20 mph)	74	10	15.5	Routine
	5/4/2015	6:45	Normal	Scattered Clouds	Southeast	Moderate-Light (5-10 mph)	74	42	21.6	Routine
	5/12/2015	6:30	Normal	Cloudy	Northeast	Moderate-Light (5-10 mph)	75	42	9.1	Routine
	5/18/2015	6:45	Normal	Partly Cloudy	South-Southeast	Moderate-Light (5-10 mph)	79	31	10.7	Routine
	5/26/2015	7:00	Normal	Partly Cloudy	Southeast	Moderate-Strong (15-20 mph)	78	31	16.2	Routine
	6/1/2015	6:45	Normal	Scattered Clouds	North	Moderate-Light (5-10 mph)	82	10	19.0	Routine
	6/8/2015	6:45	High Tide	Scattered Clouds	East-Northeast	Light (0-5 mph)	86	10	18.8	Routine
	6/8/2015	6:45	High Tide	Scattered Clouds	East-Northeast	Light (0-5 mph)	86	5	18.8	Field Duplicate
	6/15/2015	7:00	Normal	Partly Cloudy	South-Southeast	Moderate (10-15 mph)	84	306	16.9	Routine

Beach Station ID	Date	Time	Tide	Weather	Wind Direction	Wind Speed	Water Temp	Entero- cocci	Salinity	Sample Type
	6/15/2015	7:00	Normal	Partly Cloudy	South-Southeast	Moderate (10-15 mph)	84	222	16.9	Field Split
	6/22/2015	6:45	High Tide	Partly Cloudy	South	Light (0-5 mph)	85	42	12.2	Routine
	6/29/2015	7:00	Normal	Partly Cloudy	West	Moderate-Light (5-10 mph)	82	1652	31.3	Routine
	7/6/2015	7:00	High Tide	Scattered Clouds	South	Moderate-Strong (15-20 mph)	86	178	30.7	Routine
	7/13/2015	7:00	Low Tide Falling	Scattered Clouds	West-Northwest	Light (0-5 mph)	86	64	16.4	Routine
	7/20/2015	7:00	High Tide Falling	Scattered Clouds	West	Moderate-Light (5-10 mph)	86	42	33.8	Routine
	7/27/2015	7:15	Low Tide Falling	Scattered Clouds	West-Northwest	Light (0-5 mph)	86	164	35.0	Routine
	8/3/2015	11:00	High Tide Falling	Scattered Clouds	East-Northeast	Light (0-5 mph)	86	20	35.0	Routine
	8/10/2015	7:00	Low Tide Falling	Scattered Clouds	West-Northwest	Moderate-Light (5-10 mph)	86	31	35.0	Routine
	8/17/2015	6:45	High Tide Rising	Light Rain	East-Southeast	Light (0-5 mph)	86	10	24.9	Routine
	8/24/2015	7:00	Normal	Scattered Clouds	Northwest	Moderate-Light (5-10 mph)	86	10	24.9	Routine
	8/31/2015	7:00	Normal	Scattered Clouds	South-Southeast	Light (0-5 mph)	84	20	28.2	Routine
	9/8/2015	7:10	Normal	Partly Cloudy	East-Northeast	Light (0-5 mph)	85	10	25.2	Routine
	9/14/2015	7:00	Normal	Scattered Clouds	East-Northeast	Moderate-Light (5-10 mph)	78	5	27.5	Routine
	9/21/2015	7:20	Normal	Cloudy	Northeast	Moderate (10-15 mph)	83	5	25.1	Routine
	9/28/2015	7:15	Normal	Cloudy	East-Northeast	Moderate-Strong (15-20 mph)	80	53	26.1	Routine
	10/5/2015	7:15	Normal	Scattered Clouds	North	Moderate-Light (5-10 mph)	70	20	25.7	Routine
	10/12/2015	7:15	Normal	Scattered Clouds	South	Moderate-Light (5-10 mph)	76	53	27.3	Routine
	10/19/2015	7:20	High Tide Falling	Clear	North-Northeast	Moderate (10-15 mph)	70	10	29.6	Routine
	10/26/2015	7:30	Low Tide	Cloudy	North-Northwest	Strong (20-35 mph)	70	453	19.2	Field Split
	10/26/2015	7:30	Low Tide	Cloudy	North-Northwest	Strong (20-35 mph)	70	478	19.4	Routine

Holly Beach*HOLLY2**Beach Name Holly Beach - 2*

	4/13/2015	6:50	Normal	Rain	South-Southeast	Moderate (10-15 mph)	73	20	16.5	Field Duplicate
	4/13/2015	6:50	Normal	Rain	South-Southeast	Moderate (10-15 mph)	73	20	16.4	Routine
	4/20/2015	7:00	High Tide	Scattered Clouds	Northwest	Moderate-Light (5-10 mph)	73	5	18.8	Routine
	4/27/2015	7:00	Low Tide Falling	Rain	East-Southeast	Moderate-Strong (15-20 mph)	74	31	15.5	Routine
	5/4/2015	6:45	Normal	Scattered Clouds	Southeast	Moderate-Light (5-10 mph)	74	20	21.6	Routine
	5/12/2015	6:30	Normal	Cloudy	Northeast	Moderate-Light (5-10 mph)	75	53	8.9	Routine
	5/18/2015	6:45	Normal	Partly Cloudy	South-Southeast	Moderate-Light (5-10 mph)	79	42	10.7	Routine
	5/26/2015	7:00	Normal	Partly Cloudy	Southeast	Moderate-Strong (15-20 mph)	78	10	16.1	Routine
	6/1/2015	6:45	Normal	Scattered Clouds	North	Moderate-Light (5-10 mph)	82	5	19.1	Routine
	6/8/2015	6:45	High Tide	Scattered Clouds	East-Northeast	Light (0-5 mph)	86	10	18.8	Routine

Beach Station ID	Date	Time	Tide	Weather	Wind Direction	Wind Speed	Water Temp	Entero- cocci	Salinity	Sample Type
	6/15/2015	7:00	Normal	Partly Cloudy	South-Southeast	Moderate (10-15 mph)	84	560	17.0	Routine
	6/22/2015	6:45	High Tide	Partly Cloudy	South	Light (0-5 mph)	85	31	12.4	Routine
	6/29/2015	7:00	Normal	Partly Cloudy	West	Moderate-Light (5-10 mph)	82	2006	31.0	Routine
	7/6/2015	7:00	High Tide	Scattered Clouds	South	Moderate-Strong (15-20 mph)	86	111	30.5	Routine
	7/13/2015	7:00	Low Tide Falling	Scattered Clouds	West-Northwest	Light (0-5 mph)	86	53	16.4	Routine
	7/13/2015	7:00	Low Tide Falling	Scattered Clouds	West-Northwest	Light (0-5 mph)	86	31	16.4	Field Split
	7/20/2015	7:00	High Tide Falling	Scattered Clouds	West	Moderate-Light (5-10 mph)	86	150	33.6	Routine
	7/27/2015	7:15	Low Tide Falling	Scattered Clouds	West-Northwest	Light (0-5 mph)	86	87	35.0	Routine
	8/3/2015	11:00	High Tide Falling	Scattered Clouds	East-Northeast	Light (0-5 mph)	86	5	35.0	Routine
	8/3/2015	11:00	High Tide Falling	Scattered Clouds	East-Northeast	Light (0-5 mph)	86	5	35.0	Field Duplicate
	8/10/2015	7:00	Low Tide Falling	Scattered Clouds	West-Northwest	Moderate-Light (5-10 mph)	86	53	35.0	Routine
	8/17/2015	6:45	High Tide Rising	Light Rain	East-Southeast	Light (0-5 mph)	86	10	25.3	Routine
	8/24/2015	7:00	Normal	Scattered Clouds	Northwest	Moderate-Light (5-10 mph)	86	31	24.7	Routine
	8/31/2015	7:00	Normal	Scattered Clouds	South-Southeast	Light (0-5 mph)	84	31	28.0	Routine
	9/8/2015	7:10	Normal	Partly Cloudy	East-Northeast	Light (0-5 mph)	85	5	25.2	Routine
	9/14/2015	7:00	Normal	Scattered Clouds	East-Northeast	Moderate-Light (5-10 mph)	78	10	27.4	Routine
	9/21/2015	7:20	Normal	Cloudy	Northeast	Moderate (10-15 mph)	83	75	24.7	Routine
	9/28/2015	7:15	Normal	Cloudy	East-Northeast	Moderate-Strong (15-20 mph)	80	31	26.0	Field Duplicate
	9/28/2015	7:15	Normal	Cloudy	East-Northeast	Moderate-Strong (15-20 mph)	80	31	26.0	Routine
	10/5/2015	7:15	Normal	Scattered Clouds	North	Moderate-Light (5-10 mph)	70	5	25.8	Routine
	10/12/2015	7:15	Normal	Scattered Clouds	South	Moderate-Light (5-10 mph)	76	64	27.1	Routine
	10/19/2015	7:20	High Tide Falling	Clear	North-Northeast	Moderate (10-15 mph)	70	10	29.5	Routine
	10/26/2015	7:30	Low Tide	Cloudy	North-Northwest	Strong (20-35 mph)	70	782	19.1	Routine

Holly Beach*HOLLY3**Beach Name Holly Beach - 3*

	4/13/2015	6:50	Normal	Rain	South-Southeast	Moderate (10-15 mph)	73	10	16.6	Routine
	4/20/2015	7:00	High Tide	Scattered Clouds	Northwest	Moderate-Light (5-10 mph)	73	31	18.7	Routine
	4/27/2015	7:00	Low Tide Falling	Rain	East-Southeast	Moderate-Strong (15-20 mph)	74	42	15.7	Routine
	5/4/2015	6:45	Normal	Scattered Clouds	Southeast	Moderate-Light (5-10 mph)	74	5	21.6	Routine
	5/12/2015	6:30	Normal	Cloudy	Northeast	Moderate-Light (5-10 mph)	75	31	9.0	Routine
	5/18/2015	6:45	Normal	Partly Cloudy	South-Southeast	Moderate-Light (5-10 mph)	79	53	10.6	Routine
	5/26/2015	7:00	Normal	Partly Cloudy	Southeast	Moderate-Strong (15-20 mph)	78	53	16.1	Routine
	6/1/2015	6:45	Normal	Scattered Clouds	North	Moderate-Light (5-10 mph)	82	10	19.1	Field Split

Beach Station ID	Date	Time	Tide	Weather	Wind Direction	Wind Speed	Water Temp	Entero- cocci	Salinity	Sample Type
	6/1/2015	6:45	Normal	Scattered Clouds	North	Moderate-Light (5-10 mph)	82	20	19.0	Routine
	6/8/2015	6:45	High Tide	Scattered Clouds	East-Northeast	Light (0-5 mph)	86	10	18.9	Routine
	6/15/2015	7:00	Normal	Partly Cloudy	South-Southeast	Moderate (10-15 mph)	84	254	16.8	Routine
	6/22/2015	6:45	High Tide	Partly Cloudy	South	Light (0-5 mph)	85	42	12.8	Routine
	6/29/2015	7:00	Normal	Partly Cloudy	West	Moderate-Light (5-10 mph)	82	1013	31.0	Routine
	7/6/2015	7:00	High Tide	Scattered Clouds	South	Moderate-Strong (15-20 mph)	86	75	30.5	Routine
	7/13/2015	7:00	Low Tide Falling	Scattered Clouds	West-Northwest	Light (0-5 mph)	86	31	16.4	Routine
	7/20/2015	7:00	High Tide Falling	Scattered Clouds	West	Moderate-Light (5-10 mph)	86	20	33.7	Routine
	7/27/2015	7:15	Low Tide Falling	Scattered Clouds	West-Northwest	Light (0-5 mph)	86	111	35.0	Routine
	8/3/2015	11:00	High Tide Falling	Scattered Clouds	East-Northeast	Light (0-5 mph)	86	5	35.0	Routine
	8/10/2015	7:00	Low Tide Falling	Scattered Clouds	West-Northwest	Moderate-Light (5-10 mph)	86	53	35.0	Routine
	8/17/2015	6:45	High Tide Rising	Light Rain	East-Southeast	Light (0-5 mph)	86	31	25.5	Routine
	8/24/2015	7:00	Normal	Scattered Clouds	Northwest	Moderate-Light (5-10 mph)	86	10	24.6	Routine
	8/31/2015	7:00	Normal	Scattered Clouds	South-Southeast	Light (0-5 mph)	84	5	27.8	Routine
	9/8/2015	7:10	Normal	Partly Cloudy	East-Northeast	Light (0-5 mph)	85	164	25.5	Routine
	9/14/2015	7:00	Normal	Scattered Clouds	East-Northeast	Moderate-Light (5-10 mph)	78	5	27.3	Routine
	9/14/2015	7:00	Normal	Scattered Clouds	East-Northeast	Moderate-Light (5-10 mph)	78	20	27.3	Field Duplicate
	9/21/2015	7:20	Normal	Cloudy	Northeast	Moderate (10-15 mph)	83	75	24.4	Routine
	9/28/2015	7:15	Normal	Cloudy	East-Northeast	Moderate-Strong (15-20 mph)	80	192	26.0	Routine
	10/5/2015	7:15	Normal	Scattered Clouds	North	Moderate-Light (5-10 mph)	70	5	25.8	Routine
	10/12/2015	7:15	Normal	Scattered Clouds	South	Moderate-Light (5-10 mph)	76	20	27.0	Routine
	10/12/2015	7:15	Normal	Scattered Clouds	South	Moderate-Light (5-10 mph)	76	10	27.0	Field Duplicate
	10/19/2015	7:20	High Tide Falling	Clear	North-Northeast	Moderate (10-15 mph)	70	10	29.4	Routine
	10/26/2015	7:30	Low Tide	Cloudy	North-Northwest	Strong (20-35 mph)	70	591	19.1	Routine

Holly Beach*HOLLY4**Beach Name Holly Beach - 4*

	4/13/2015	6:50	Normal	Rain	South-Southeast	Moderate (10-15 mph)	73	20	16.6	Routine
	4/20/2015	7:00	High Tide	Scattered Clouds	Northwest	Moderate-Light (5-10 mph)	73	20	18.9	Field Split
	4/20/2015	7:00	High Tide	Scattered Clouds	Northwest	Moderate-Light (5-10 mph)	73	20	18.9	Routine
	4/27/2015	7:00	Low Tide Falling	Rain	East-Southeast	Moderate-Strong (15-20 mph)	74	31	15.8	Routine
	5/4/2015	6:45	Normal	Scattered Clouds	Southeast	Moderate-Light (5-10 mph)	74	64	21.5	Routine
	5/12/2015	6:30	Normal	Cloudy	Northeast	Moderate-Light (5-10 mph)	75	20	9.0	Routine
	5/18/2015	6:45	Normal	Partly Cloudy	South-Southeast	Moderate-Light (5-10 mph)	79	42	10.5	Routine

Beach Station ID	Date	Time	Tide	Weather	Wind Direction	Wind Speed	Water Temp	Entero- cocci	Salinity	Sample Type
	5/26/2015	7:00	Normal	Partly Cloudy	Southeast	Moderate-Strong (15-20 mph)	78	53	16.1	Routine
	6/1/2015	6:45	Normal	Scattered Clouds	North	Moderate-Light (5-10 mph)	82	2006	19.0	Routine
	6/8/2015	6:45	High Tide	Scattered Clouds	East-Northeast	Light (0-5 mph)	86	5	18.9	Field Split
	6/8/2015	6:45	High Tide	Scattered Clouds	East-Northeast	Light (0-5 mph)	86	20	18.9	Routine
	6/15/2015	7:00	Normal	Partly Cloudy	South-Southeast	Moderate (10-15 mph)	84	207	16.9	Routine
	6/22/2015	6:45	High Tide	Partly Cloudy	South	Light (0-5 mph)	85	20	12.7	Routine
	6/29/2015	7:00	Normal	Partly Cloudy	West	Moderate-Light (5-10 mph)	82	1652	31.0	Routine
	7/6/2015	7:00	High Tide	Scattered Clouds	South	Moderate-Strong (15-20 mph)	86	42	30.5	Routine
	7/13/2015	7:00	Low Tide Falling	Scattered Clouds	West-Northwest	Light (0-5 mph)	86	42	16.5	Routine
	7/20/2015	7:00	High Tide Falling	Scattered Clouds	West	Moderate-Light (5-10 mph)	86	20	33.7	Routine
	7/27/2015	7:15	Low Tide Falling	Scattered Clouds	West-Northwest	Light (0-5 mph)	86	31	35.0	Routine
	8/3/2015	11:00	High Tide Falling	Scattered Clouds	East-Northeast	Light (0-5 mph)	86	5	35.0	Routine
	8/10/2015	7:00	Low Tide Falling	Scattered Clouds	West-Northwest	Moderate-Light (5-10 mph)	86	10	35.0	Routine
	8/17/2015	6:45	High Tide Rising	Light Rain	East-Southeast	Light (0-5 mph)	86	20	25.6	Routine
	8/24/2015	7:00	Normal	Scattered Clouds	Northwest	Moderate-Light (5-10 mph)	86	31	24.6	Field Duplicate
	8/24/2015	7:00	Normal	Scattered Clouds	Northwest	Moderate-Light (5-10 mph)	86	10	24.6	Routine
	8/31/2015	7:00	Normal	Scattered Clouds	South-Southeast	Light (0-5 mph)	84	20	27.8	Routine
	9/8/2015	7:10	Normal	Partly Cloudy	East-Northeast	Light (0-5 mph)	85	75	25.4	Routine
	9/14/2015	7:00	Normal	Scattered Clouds	East-Northeast	Moderate-Light (5-10 mph)	78	20	27.3	Routine
	9/21/2015	7:20	Normal	Cloudy	Northeast	Moderate (10-15 mph)	83	20	24.7	Routine
	9/28/2015	7:15	Normal	Cloudy	East-Northeast	Moderate-Strong (15-20 mph)	80	192	26.0	Routine
	10/5/2015	7:15	Normal	Scattered Clouds	North	Moderate-Light (5-10 mph)	70	5	25.8	Routine
	10/12/2015	7:15	Normal	Scattered Clouds	South	Moderate-Light (5-10 mph)	76	10	27.0	Routine
	10/19/2015	7:20	High Tide Falling	Clear	North-Northeast	Moderate (10-15 mph)	70	5	29.5	Routine
	10/26/2015	7:30	Low Tide	Cloudy	North-Northwest	Strong (20-35 mph)	70	478	19.1	Routine

Holly Beach*HOLLY5**Beach Name Holly Beach - 5*

	4/13/2015	6:50	Normal	Rain	South-Southeast	Moderate (10-15 mph)	73	53	16.6	Routine
	4/20/2015	7:00	High Tide	Scattered Clouds	Northwest	Moderate-Light (5-10 mph)	73	31	19.0	Routine
	4/27/2015	7:00	Low Tide Falling	Rain	East-Southeast	Moderate-Strong (15-20 mph)	74	5	15.8	Routine
	5/4/2015	6:45	Normal	Scattered Clouds	Southeast	Moderate-Light (5-10 mph)	74	20	21.5	Routine
	5/12/2015	6:30	Normal	Cloudy	Northeast	Moderate-Light (5-10 mph)	75	31	9.0	Routine
	5/18/2015	6:45	Normal	Partly Cloudy	South-Southeast	Moderate-Light (5-10 mph)	79	42	10.7	Routine

Beach Station ID	Date	Time	Tide	Weather	Wind Direction	Wind Speed	Water Temp	Entero- cocci	Salinity	Sample Type
	5/26/2015	7:00	Normal	Partly Cloudy	Southeast	Moderate-Strong (15-20 mph)	78	20	16.1	Routine
	6/1/2015	6:45	Normal	Scattered Clouds	North	Moderate-Light (5-10 mph)	82	31	19.0	Routine
	6/8/2015	6:45	High Tide	Scattered Clouds	East-Northeast	Light (0-5 mph)	86	20	19.2	Routine
	6/15/2015	7:00	Normal	Partly Cloudy	South-Southeast	Moderate (10-15 mph)	84	344	16.9	Routine
	6/22/2015	6:45	High Tide	Partly Cloudy	South	Light (0-5 mph)	85	10	12.8	Field Duplicate
	6/22/2015	6:45	High Tide	Partly Cloudy	South	Light (0-5 mph)	85	5	12.7	Routine
	6/29/2015	7:00	Normal	Partly Cloudy	West	Moderate-Light (5-10 mph)	82	885	31.1	Routine
	7/6/2015	7:00	High Tide	Scattered Clouds	South	Moderate-Strong (15-20 mph)	86	99	30.5	Routine
	7/13/2015	7:00	Low Tide Falling	Scattered Clouds	West-Northwest	Light (0-5 mph)	86	53	16.5	Routine
	7/20/2015	7:00	High Tide Falling	Scattered Clouds	West	Moderate-Light (5-10 mph)	86	10	33.5	Routine
	7/27/2015	7:15	Low Tide Falling	Scattered Clouds	West-Northwest	Light (0-5 mph)	86	64	35.0	Routine
	8/3/2015	11:00	High Tide Falling	Scattered Clouds	East-Northeast	Light (0-5 mph)	86	5	35.0	Routine
	8/10/2015	7:00	Low Tide Falling	Scattered Clouds	West-Northwest	Moderate-Light (5-10 mph)	86	31	35.0	Routine
	8/17/2015	6:45	High Tide Rising	Light Rain	East-Southeast	Light (0-5 mph)	86	75	25.6	Routine
	8/24/2015	7:00	Normal	Scattered Clouds	Northwest	Moderate-Light (5-10 mph)	86	10	24.5	Routine
	8/31/2015	7:00	Normal	Scattered Clouds	South-Southeast	Light (0-5 mph)	84	5	27.7	Routine
	9/8/2015	7:10	Normal	Partly Cloudy	East-Northeast	Light (0-5 mph)	85	53	25.4	Routine
	9/14/2015	7:00	Normal	Scattered Clouds	East-Northeast	Moderate-Light (5-10 mph)	78	5	27.3	Routine
	9/21/2015	7:20	Normal	Cloudy	Northeast	Moderate (10-15 mph)	83	5	24.6	Routine
	9/28/2015	7:15	Normal	Cloudy	East-Northeast	Moderate-Strong (15-20 mph)	80	111	26.1	Routine
	10/5/2015	7:15	Normal	Scattered Clouds	North	Moderate-Light (5-10 mph)	70	5	25.8	Routine
	10/12/2015	7:15	Normal	Scattered Clouds	South	Moderate-Light (5-10 mph)	76	10	27.1	Routine
	10/19/2015	7:20	High Tide Falling	Clear	North-Northeast	Moderate (10-15 mph)	70	20	29.4	Routine
	10/26/2015	7:30	Low Tide	Cloudy	North-Northwest	Strong (20-35 mph)	70	453	19.1	Routine

Holly Beach*HOLLY6**Beach Name Holly Beach - 6*

	4/13/2015	6:50	Normal	Rain	South-Southeast	Moderate (10-15 mph)	73	344	16.5	Routine
	4/20/2015	7:00	High Tide	Scattered Clouds	Northwest	Moderate-Light (5-10 mph)	73	5	19.0	Routine
	4/27/2015	7:00	Low Tide Falling	Rain	East-Southeast	Moderate-Strong (15-20 mph)	74	111	15.8	Routine
	5/4/2015	6:45	Normal	Scattered Clouds	Southeast	Moderate-Light (5-10 mph)	74	20	21.4	Routine
	5/12/2015	6:30	Normal	Cloudy	Northeast	Moderate-Light (5-10 mph)	75	31	9.1	Routine
	5/18/2015	6:45	Normal	Partly Cloudy	South-Southeast	Moderate-Light (5-10 mph)	79	20	11.5	Routine
	5/26/2015	7:00	Normal	Partly Cloudy	Southeast	Moderate-Strong (15-20 mph)	78	53	16.1	Routine

Beach Station ID	Date	Time	Tide	Weather	Wind Direction	Wind Speed	Water Temp	Entero- cocci	Salinity	Sample Type
	6/1/2015	6:45	Normal	Scattered Clouds	North	Moderate-Light (5-10 mph)	82	20	18.9	Routine
	6/8/2015	6:45	High Tide	Scattered Clouds	East-Northeast	Light (0-5 mph)	86	10	19.0	Routine
	6/15/2015	7:00	Normal	Partly Cloudy	South-Southeast	Moderate (10-15 mph)	84	288	17.0	Routine
	6/22/2015	6:45	High Tide	Partly Cloudy	South	Light (0-5 mph)	85	10	12.8	Routine
	6/29/2015	7:00	Normal	Partly Cloudy	West	Moderate-Light (5-10 mph)	82	738	31.0	Routine
	6/29/2015	7:00	Normal	Partly Cloudy	West	Moderate-Light (5-10 mph)	82	560	31.0	Field Duplicate
	7/6/2015	7:00	High Tide	Scattered Clouds	South	Moderate-Strong (15-20 mph)	86	150	30.6	Routine
	7/13/2015	7:00	Low Tide Falling	Scattered Clouds	West-Northwest	Light (0-5 mph)	86	42	16.6	Routine
	7/20/2015	7:00	High Tide Falling	Scattered Clouds	West	Moderate-Light (5-10 mph)	86	53	33.6	Routine
	7/27/2015	7:15	Low Tide Falling	Scattered Clouds	West-Northwest	Light (0-5 mph)	86	31	35.0	Routine
	8/3/2015	11:00	High Tide Falling	Scattered Clouds	East-Northeast	Light (0-5 mph)	86	10	35.0	Routine
	8/10/2015	7:00	Low Tide Falling	Scattered Clouds	West-Northwest	Moderate-Light (5-10 mph)	86	42	35.0	Routine
	8/17/2015	6:45	High Tide Rising	Light Rain	East-Southeast	Light (0-5 mph)	86	10	26.0	Routine
	8/24/2015	7:00	Normal	Scattered Clouds	Northwest	Moderate-Light (5-10 mph)	86	42	24.5	Routine
	8/24/2015	7:00	Normal	Scattered Clouds	Northwest	Moderate-Light (5-10 mph)	86	31	24.5	Field Split
	8/31/2015	7:00	Normal	Scattered Clouds	South-Southeast	Light (0-5 mph)	84	20	27.5	Routine
	9/8/2015	7:10	Normal	Partly Cloudy	East-Northeast	Light (0-5 mph)	85	87	25.5	Routine
	9/14/2015	7:00	Normal	Scattered Clouds	East-Northeast	Moderate-Light (5-10 mph)	78	5	27.3	Routine
	9/21/2015	7:20	Normal	Cloudy	Northeast	Moderate (10-15 mph)	83	42	24.8	Routine
	9/28/2015	7:15	Normal	Cloudy	East-Northeast	Moderate-Strong (15-20 mph)	80	192	26.0	Routine
	10/5/2015	7:15	Normal	Scattered Clouds	North	Moderate-Light (5-10 mph)	70	10	25.9	Routine
	10/12/2015	7:15	Normal	Scattered Clouds	South	Moderate-Light (5-10 mph)	76	5	27.0	Routine
	10/19/2015	7:20	High Tide Falling	Clear	North-Northeast	Moderate (10-15 mph)	70	5	29.4	Routine
	10/26/2015	7:30	Low Tide	Cloudy	North-Northwest	Strong (20-35 mph)	70	1652	18.7	Routine

Little Florida

LTFLI

Beach Name Little Florida

	4/13/2015	6:50	Normal	Rain	South-Southeast	Moderate (10-15 mph)	73	99	15.2	Routine
	4/20/2015	7:00	High Tide	Scattered Clouds	Northwest	Moderate-Light (5-10 mph)	73	10	18.4	Routine
	4/27/2015	7:00	Low Tide Falling	Rain	East-Southeast	Moderate-Strong (15-20 mph)	74	31	17.5	Routine
	5/4/2015	6:45	Normal	Scattered Clouds	Southeast	Moderate-Light (5-10 mph)	74	87	26.0	Routine
	5/12/2015	6:30	Normal	Cloudy	Northeast	Moderate-Light (5-10 mph)	75	31	8.9	Routine
	5/18/2015	6:45	Normal	Partly Cloudy	South-Southeast	Moderate-Light (5-10 mph)	80	20	11.4	Routine
	5/26/2015	7:00	Normal	Partly Cloudy	Southeast	Moderate-Strong (15-20 mph)	78	5	18.2	Routine

Beach Station ID	Date	Time	Tide	Weather	Wind Direction	Wind Speed	Water Temp	Entero- cocci	Salinity	Sample Type
	6/1/2015	6:45	Normal	Scattered Clouds	North	Moderate-Light (5-10 mph)	82	10	18.6	Routine
	6/8/2015	6:45	High Tide	Scattered Clouds	East-Northeast	Light (0-5 mph)	86	10	19.5	Routine
	6/15/2015	7:00	Normal	Partly Cloudy	South-Southeast	Moderate (10-15 mph)	84	1091	18.8	Routine
	6/22/2015	6:45	High Tide	Partly Cloudy	South	Light (0-5 mph)	85	5	19.3	Routine
	6/29/2015	7:00	Normal	Partly Cloudy	West	Moderate-Light (5-10 mph)	82	75	30.7	Routine
	7/6/2015	7:00	High Tide	Scattered Clouds	South	Moderate-Strong (15-20 mph)	86	64	30.4	Routine
	7/13/2015	7:00	Low Tide Falling	Scattered Clouds	West-Northwest	Light (0-5 mph)	86	10	17.8	Routine
	7/20/2015	7:00	High Tide Falling	Scattered Clouds	West	Moderate-Light (5-10 mph)	86	20	33.4	Routine
	7/27/2015	7:15	Low Tide Falling	Scattered Clouds	West-Northwest	Light (0-5 mph)	86	5	34.8	Routine
	8/3/2015	11:00	High Tide Falling	Scattered Clouds	East-Northeast	Light (0-5 mph)	86	10	34.9	Routine
	8/10/2015	7:00	Low Tide Falling	Scattered Clouds	West-Northwest	Moderate-Light (5-10 mph)	86	42	35.0	Routine
	8/10/2015	7:00	Low Tide Falling	Scattered Clouds	West-Northwest	Moderate-Light (5-10 mph)	86	31	35.0	Field Split
	8/17/2015	6:45	High Tide Rising	Light Rain	East-Southeast	Light (0-5 mph)	86	20	28.1	Routine
	8/24/2015	7:00	Normal	Scattered Clouds	Northwest	Moderate-Light (5-10 mph)	86	42	25.2	Routine
	8/31/2015	7:00	Normal	Scattered Clouds	South-Southeast	Light (0-5 mph)	84	5	27.6	Routine
	9/8/2015	7:10	Normal	Partly Cloudy	East-Northeast	Light (0-5 mph)	85	31	26.2	Routine
	9/14/2015	7:00	Normal	Scattered Clouds	East-Northeast	Moderate-Light (5-10 mph)	78	31	26.9	Routine
	9/21/2015	7:20	Normal	Cloudy	Northeast	Moderate (10-15 mph)	83	10	26.7	Routine
	9/28/2015	7:15	Normal	Cloudy	East-Northeast	Moderate-Strong (15-20 mph)	80	99	25.4	Routine
	10/5/2015	7:15	Normal	Scattered Clouds	North	Moderate-Light (5-10 mph)	70	5	26.5	Routine
	10/12/2015	7:15	Normal	Scattered Clouds	South	Moderate-Light (5-10 mph)	76	10	27.6	Routine
	10/19/2015	7:20	High Tide Falling	Clear	North-Northeast	Moderate (10-15 mph)	70	5	28.4	Routine
	10/26/2015	7:30	Low Tide	Cloudy	North-Northwest	Strong (20-35 mph)	70	364	19.7	Routine

Long Beach*DUNGI**Beach Name Long Beach*

	4/13/2015	6:50	Normal	Rain	South-Southeast	Moderate (10-15 mph)	73	10	15.2	Routine
	4/20/2015	7:00	High Tide	Scattered Clouds	Northwest	Moderate-Light (5-10 mph)	73	10	18.3	Routine
	4/27/2015	7:00	Low Tide Falling	Rain	East-Southeast	Moderate-Strong (15-20 mph)	74	31	17.8	Routine
	5/4/2015	6:45	Normal	Scattered Clouds	Southeast	Moderate-Light (5-10 mph)	74	164	26.0	Field Duplicate
	5/4/2015	6:45	Normal	Scattered Clouds	Southeast	Moderate-Light (5-10 mph)	74	75	26.0	Routine
	5/12/2015	6:30	Normal	Cloudy	Northeast	Moderate-Light (5-10 mph)	75	10	9.0	Routine
	5/18/2015	6:45	Normal	Partly Cloudy	South-Southeast	Moderate-Light (5-10 mph)	80	31	11.5	Routine
	5/26/2015	7:00	Normal	Partly Cloudy	Southeast	Moderate-Strong (15-20 mph)	78	10	18.3	Routine

Beach Station ID	Date	Time	Tide	Weather	Wind Direction	Wind Speed	Water Temp	Entero- cocci	Salinity	Sample Type
	6/1/2015	6:45	Normal	Scattered Clouds	North	Moderate-Light (5-10 mph)	82	10	19.4	Routine
	6/8/2015	6:45	High Tide	Scattered Clouds	East-Northeast	Light (0-5 mph)	86	20	19.5	Routine
	6/15/2015	7:00	Normal	Partly Cloudy	South-Southeast	Moderate (10-15 mph)	84	453	18.8	Routine
	6/22/2015	6:45	High Tide	Partly Cloudy	South	Light (0-5 mph)	85	20	19.4	Routine
	6/29/2015	7:00	Normal	Partly Cloudy	West	Moderate-Light (5-10 mph)	82	164	30.8	Routine
	7/6/2015	7:00	High Tide	Scattered Clouds	South	Moderate-Strong (15-20 mph)	86	42	30.5	Routine
	7/13/2015	7:00	Low Tide Falling	Scattered Clouds	West-Northwest	Light (0-5 mph)	86	10	19.3	Routine
	7/20/2015	7:00	High Tide Falling	Scattered Clouds	West	Moderate-Light (5-10 mph)	86	42	33.6	Routine
	7/27/2015	7:15	Low Tide Falling	Scattered Clouds	West-Northwest	Light (0-5 mph)	86	20	34.8	Routine
	8/3/2015	11:00	High Tide Falling	Scattered Clouds	East-Northeast	Light (0-5 mph)	86	5	35.0	Routine
	8/10/2015	7:00	Low Tide Falling	Scattered Clouds	West-Northwest	Moderate-Light (5-10 mph)	86	10	35.0	Routine
	8/17/2015	6:45	High Tide Rising	Light Rain	East-Southeast	Light (0-5 mph)	86	10	28.3	Routine
	8/24/2015	7:00	Normal	Scattered Clouds	Northwest	Moderate-Light (5-10 mph)	86	5	25.5	Routine
	8/31/2015	7:00	Normal	Scattered Clouds	South-Southeast	Light (0-5 mph)	84	5	27.6	Routine
	9/8/2015	7:10	Normal	Partly Cloudy	East-Northeast	Light (0-5 mph)	85	10	26.4	Field Split
	9/8/2015	7:10	Normal	Partly Cloudy	East-Northeast	Light (0-5 mph)	85	31	26.4	Routine
	9/14/2015	7:00	Normal	Scattered Clouds	East-Northeast	Moderate-Light (5-10 mph)	78	64	27.2	Routine
	9/21/2015	7:20	Normal	Cloudy	Northeast	Moderate (10-15 mph)	83	42	26.9	Routine
	9/28/2015	7:15	Normal	Cloudy	East-Northeast	Moderate-Strong (15-20 mph)	80	42	25.4	Routine
	10/5/2015	7:15	Normal	Scattered Clouds	North	Moderate-Light (5-10 mph)	70	5	26.6	Routine
	10/12/2015	7:15	Normal	Scattered Clouds	South	Moderate-Light (5-10 mph)	76	10	27.5	Routine
	10/19/2015	7:20	High Tide Falling	Clear	North-Northeast	Moderate (10-15 mph)	70	5	28.2	Routine
	10/19/2015	7:20	High Tide Falling	Clear	North-Northeast	Moderate (10-15 mph)	70	5	28.2	Field Split
	10/26/2015	7:30	Low Tide	Cloudy	North-Northwest	Strong (20-35 mph)	70	222	19.5	Routine
	10/26/2015	7:30	Low Tide	Cloudy	North-Northwest	Strong (20-35 mph)	70	192	19.4	Field Duplicate

Martin Beach*MARTI**Beach Name Martin Beach*

	4/13/2015	6:50	Normal	Rain	South-Southeast	Moderate (10-15 mph)	73	99	15.3	Routine
	4/20/2015	7:00	High Tide	Scattered Clouds	Northwest	Moderate-Light (5-10 mph)	73	20	19.3	Routine
	4/27/2015	7:00	Low Tide Falling	Rain	East-Southeast	Moderate-Strong (15-20 mph)	74	5	18.4	Routine
	4/27/2015	7:00	Low Tide Falling	Rain	East-Southeast	Moderate-Strong (15-20 mph)	74	5	18.4	Field Split
	5/4/2015	6:45	Normal	Scattered Clouds	Southeast	Moderate-Light (5-10 mph)	74	10	25.3	Routine
	5/12/2015	6:30	Normal	Cloudy	Northeast	Moderate-Light (5-10 mph)	75	20	9.2	Routine

Beach Station ID	Date	Time	Tide	Weather	Wind Direction	Wind Speed	Water Temp	Entero- cocci	Salinity	Sample Type
	5/18/2015	6:45	Normal	Partly Cloudy	South-Southeast	Moderate-Light (5-10 mph)	80	20	11.7	Routine
	5/26/2015	7:00	Normal	Partly Cloudy	Southeast	Moderate-Strong (15-20 mph)	78	20	18.6	Routine
	5/26/2015	7:00	Normal	Partly Cloudy	Southeast	Moderate-Strong (15-20 mph)	78	42	18.6	Field Duplicate
	6/1/2015	6:45	Normal	Scattered Clouds	North	Moderate-Light (5-10 mph)	82	31	19.0	Routine
	6/8/2015	6:45	High Tide	Scattered Clouds	East-Northeast	Light (0-5 mph)	86	5	19.3	Routine
	6/15/2015	7:00	Normal	Partly Cloudy	South-Southeast	Moderate (10-15 mph)	84	885	18.8	Routine
	6/22/2015	6:45	High Tide	Partly Cloudy	South	Light (0-5 mph)	85	111	19.3	Routine
	6/29/2015	7:00	Normal	Partly Cloudy	West	Moderate-Light (5-10 mph)	82	75	30.3	Routine
	6/29/2015	7:00	Normal	Partly Cloudy	West	Moderate-Light (5-10 mph)	82	31	30.3	Field Split
	7/6/2015	7:00	High Tide	Scattered Clouds	South	Moderate-Strong (15-20 mph)	86	20	30.8	Routine
	7/13/2015	7:00	Low Tide Falling	Scattered Clouds	West-Northwest	Light (0-5 mph)	86	10	21.6	Routine
	7/20/2015	7:00	High Tide Falling	Scattered Clouds	West	Moderate-Light (5-10 mph)	86	31	33.9	Routine
	7/27/2015	7:15	Low Tide Falling	Scattered Clouds	West-Northwest	Light (0-5 mph)	86	5	35.0	Routine
	8/3/2015	11:00	High Tide Falling	Scattered Clouds	East-Northeast	Light (0-5 mph)	86	99	35.0	Routine
	8/10/2015	7:00	Low Tide Falling	Scattered Clouds	West-Northwest	Moderate-Light (5-10 mph)	86	20	35.0	Routine
	8/17/2015	6:45	High Tide Rising	Light Rain	East-Southeast	Light (0-5 mph)	86	10	27.9	Routine
	8/24/2015	7:00	Normal	Scattered Clouds	Northwest	Moderate-Light (5-10 mph)	86	20	25.6	Routine
	8/31/2015	7:00	Normal	Scattered Clouds	South-Southeast	Light (0-5 mph)	84	5	26.8	Routine
	9/8/2015	7:10	Normal	Partly Cloudy	East-Northeast	Light (0-5 mph)	85	5	26.3	Routine
	9/8/2015	7:10	Normal	Partly Cloudy	East-Northeast	Light (0-5 mph)	85	5	26.2	Field Split
	9/14/2015	7:00	Normal	Scattered Clouds	East-Northeast	Moderate-Light (5-10 mph)	78	5	27.4	Routine
	9/21/2015	7:20	Normal	Cloudy	Northeast	Moderate (10-15 mph)	83	10	26.6	Field Duplicate
	9/21/2015	7:20	Normal	Cloudy	Northeast	Moderate (10-15 mph)	83	10	26.6	Routine
	9/28/2015	7:15	Normal	Cloudy	East-Northeast	Moderate-Strong (15-20 mph)	80	20	25.2	Routine
	10/5/2015	7:15	Normal	Scattered Clouds	North	Moderate-Light (5-10 mph)	70	5	26.5	Routine
	10/12/2015	7:15	Normal	Scattered Clouds	South	Moderate-Light (5-10 mph)	76	5	27.6	Routine
	10/19/2015	7:20	High Tide Falling	Clear	North-Northeast	Moderate (10-15 mph)	70	5	28.1	Routine
	10/26/2015	7:30	Low Tide	Cloudy	North-Northwest	Strong (20-35 mph)	70	111	19.7	Routine
	10/26/2015	7:30	Low Tide	Cloudy	North-Northwest	Strong (20-35 mph)	70	99	19.7	Field Split

North Beach*LCNBI**Beach Name North Beach*

4/13/2015	7:00	High Tide Falling	Rain	West-Southwest	Moderate (10-15 mph)	66	344	1.0	Routine
4/13/2015	7:00	High Tide Falling	Rain	West-Southwest	Moderate (10-15 mph)	66	697	1.0	Field Split

Beach Station ID	Date	Time	Tide	Weather	Wind Direction	Wind Speed	Water Temp	Entero- cocci	Salinity	Sample Type	
	4/20/2015	7:25	High Tide	Falling	Clear	North	Moderate (10-15 mph)	65	5	0.1	Routine
	4/27/2015	7:30	High Tide	Falling	Rain	West-Southwest	Strong (20-35 mph)	68	99	0.1	Routine
	5/4/2015	6:30	High Tide	Falling	Scattered Clouds	East-Southeast	Light (0-5 mph)	69	87	0.1	Routine
	5/11/2015	6:30	High Tide	Falling	Cloudy	South	Moderate-Light (5-10 mph)	73	42	1.1	Routine
	5/18/2015	7:20	High Tide	Falling	Cloudy	East-Southeast	Moderate-Light (5-10 mph)	75	288	1.1	Routine
	5/26/2015	7:10	High Tide	Falling	Cloudy	South-Southeast	Moderate (10-15 mph)	75	591	0.4	Routine
	6/1/2015	6:30	High Tide	Falling	Scattered Clouds	North-Northeast	Light (0-5 mph)		75	0.1	Routine
	6/8/2015	6:40	Low Tide		Partly Cloudy	South-Southeast	Light (0-5 mph)	79	5	0.2	Routine
	6/15/2015	6:30	High Tide	Falling	Cloudy	East-Southeast	Light (0-5 mph)	77	207	1.9	Routine
	6/22/2015	6:40	High Tide	Falling	Partly Cloudy	South-Southeast	Light (0-5 mph)	82	20	0.5	Routine
	6/29/2015	6:35	High Tide	Falling	Partly Cloudy	West-Southwest	Light (0-5 mph)	80	20	0.5	Routine
	7/6/2015	6:30	High Tide	Falling	Partly Cloudy	South-Southeast	Moderate-Light (5-10 mph)	80	64	0.7	Routine
	7/13/2015	6:20	High Tide	Falling	Scattered Clouds	West-Southwest	Moderate-Light (5-10 mph)	82	5	1.4	Routine
	7/20/2015	6:30	Low Tide	Falling	Partly Cloudy	West-Southwest	Light (0-5 mph)	83	10	2.5	Routine
	7/27/2015	6:30	High Tide	Falling	Partly Cloudy	North	Light (0-5 mph)	84	53	3.7	Routine
	8/3/2015	6:30	Low Tide	Falling	Partly Cloudy	North-Northeast	Light (0-5 mph)	82	5	11.2	Routine
	8/10/2015	6:20	High Tide	Falling	Partly Cloudy	West	Moderate-Light (5-10 mph)	80	5	8.5	Routine
	8/17/2015	6:25	High Tide	Falling	Partly Cloudy	East-Northeast	Light (0-5 mph)	83	42	16.4	Routine
	8/24/2015	6:30	High Tide	Falling	Scattered Clouds	West	Light (0-5 mph)	84	10	8.8	Routine
	8/31/2015	6:10	High Tide	Falling	Partly Cloudy	North-Northeast	Light (0-5 mph)	82	10	11.3	Routine
	9/8/2015	7:05	High Tide	Falling	Scattered Clouds	Calm	Calm (0 mph)	83	124	10.4	Routine
	9/14/2015	7:20	High Tide	Falling	Clear	East-Northeast	Light (0-5 mph)	77	20	9.4	Routine
	9/21/2015	6:25	High Tide	Falling	Cloudy	East-Southeast	Light (0-5 mph)	80	10	11.7	Routine
	9/28/2015	6:20	High Tide		Rain	South-Southeast	Moderate (10-15 mph)	80	164	16.5	Routine
	10/5/2015	6:30	High Tide	Falling	Clear	North-Northwest	Light (0-5 mph)	74	344	11.4	Routine
	10/12/2015	6:20	High Tide	Falling	Clear	South-Southeast	Moderate-Light (5-10 mph)	74	10	12.1	Routine
	10/19/2015	6:20	High Tide	Falling	Scattered Clouds	East-Southeast	Light (0-5 mph)	68	5	15.9	Routine
	10/26/2015	6:20	High Tide	Falling	Light Rain	North-Northwest	Moderate-Light (5-10 mph)	64	429	19.8	Routine

Rutherford Beach*RUTH1**Beach Name Rutherford Beach*

4/13/2015	8:05	Low Tide	Falling	Rain	Southeast	Moderate-Light (5-10 mph)	70	222	12.6	Routine
4/20/2015	7:55	Low Tide	Falling	Clear	North	Moderate-Light (5-10 mph)	70	64	16.2	Routine
4/27/2015	7:40	Low Tide		Cloudy	Northwest	Moderate-Strong (15-20 mph)	77	75	11.8	Routine

Beach Station ID	Date	Time	Tide	Weather	Wind Direction	Wind Speed	Water Temp	Entero- cocci	Salinity	Sample Type
	5/4/2015	7:45	Low Tide	Scattered Clouds	East-Southeast	Light (0-5 mph)	82	75	24.5	Routine
	5/11/2015	7:45	Low Tide Falling	Cloudy	South	Moderate-Light (5-10 mph)	90	111	5.0	Routine
	5/18/2015	7:50	Low Tide	Partly Cloudy	South	Light (0-5 mph)	89	192	6.3	Routine
	5/26/2015	7:55	Low Tide	Cloudy	East	Moderate-Light (5-10 mph)	78	87	12.6	Routine
	6/1/2015	7:50	Low Tide	Partly Cloudy	East-Northeast	Moderate-Light (5-10 mph)	88	64	19.4	Routine
	6/8/2015	7:40	High Tide Falling	Partly Cloudy	East-Northeast	Light (0-5 mph)	81	10	13.2	Routine
	6/15/2015	7:45	High Tide Falling	Partly Cloudy	East	Moderate-Light (5-10 mph)	79	384	10.4	Routine
	6/22/2015	7:45	Low Tide Falling	Partly Cloudy	South	Light (0-5 mph)	83	192	10.2	Routine
	6/29/2015	7:40	Low Tide Falling	Scattered Clouds	South-Southwest	Moderate-Light (5-10 mph)	80	831	30.3	Routine
	7/6/2015	7:45	High Tide Rising	Scattered Clouds	South	Moderate-Light (5-10 mph)	81	560	25.7	Routine
	7/13/2015	7:40	High Tide Falling	Clear	West-Northwest	Light (0-5 mph)	81	42	12.2	Routine
	7/20/2015	7:55	High Tide	Clear	West-Southwest	Light (0-5 mph)	82	31	33.1	Routine
	7/27/2015	7:47	Low Tide	Partly Cloudy	West	Light (0-5 mph)	82	20	34.7	Routine
	8/3/2015	7:52	High Tide Falling	Clear	North-Northeast	Light (0-5 mph)	80	20	35.0	Routine
	8/10/2015	7:46	Low Tide	Clear	West	Light (0-5 mph)	81	20	35.0	Routine
	8/17/2015	7:45	High Tide Falling	Cloudy	East	Light (0-5 mph)	79	42	20.8	Routine
	8/24/2015	7:47	Low Tide	Sleet	West	Light (0-5 mph)	82	20	20.0	Routine
	8/31/2015	7:45	High Tide Falling	Partly Cloudy	East	Light (0-5 mph)	79	64	26.4	Routine
	9/8/2015	7:49	Low Tide	Partly Cloudy	East	Light (0-5 mph)	81	31	23.5	Routine
	9/14/2015	7:48	High Tide Falling	Clear	Northeast	Light (0-5 mph)	70	10	26.3	Routine
	9/21/2015	7:55	Low Tide	Cloudy	East-Northeast	Moderate-Light (5-10 mph)	79	64	25.8	Routine
	9/28/2015	7:50	High Tide Falling	Cloudy	East	Moderate-Light (5-10 mph)	78	111	24.9	Routine
	10/5/2015	7:51	Low Tide Falling	Clear	North	Light (0-5 mph)	64	504	27.8	Routine
	10/12/2015	7:55	Low Tide	Clear	South-Southeast	Moderate-Light (5-10 mph)	73	20	28.8	Routine
	10/19/2015	7:45	High Tide	Clear	North-Northeast	Light (0-5 mph)	61	192	30.1	Routine
	10/26/2015	7:44	Extremely Low Tide	Cloudy	North	Moderate-Strong (15-20 mph)	63	192	21.1	Routine

South Beach and Rabbit Island

<i>LCSBI</i>	<i>Beach Name South Beach and Rabbit Island</i>									
	4/13/2015	7:00	High Tide Falling	Rain	West-Southwest	Moderate (10-15 mph)	66	164	2.8	Routine
	4/20/2015	7:25	High Tide Falling	Clear	North	Moderate (10-15 mph)	65	20	0.1	Routine
	4/27/2015	7:30	High Tide Falling	Rain	West-Southwest	Strong (20-35 mph)	68	1091	0.2	Routine
	4/27/2015	7:30	High Tide Falling	Rain	West-Southwest	Strong (20-35 mph)	68	2006	0.2	Field Duplicate
	5/4/2015	6:30	High Tide Falling	Scattered Clouds	East-Southeast	Light (0-5 mph)	69	31	0.2	Routine

Beach Station ID	Date	Time	Tide	Weather	Wind Direction	Wind Speed	Water Temp	Entero- cocci	Salinity	Sample Type	
	5/11/2015	6:30	High Tide	Falling	Cloudy	South	Moderate-Light (5-10 mph)	73	111	1.9	Field Split
	5/11/2015	6:30	High Tide	Falling	Cloudy	South	Moderate-Light (5-10 mph)	73	31	1.9	Routine
	5/18/2015	7:20	High Tide	Falling	Cloudy	East-Southeast	Moderate-Light (5-10 mph)	75	75	2.2	Routine
	5/18/2015	7:20	High Tide	Falling	Cloudy	East-Southeast	Moderate-Light (5-10 mph)	75	288	2.2	Field Duplicate
	5/26/2015	7:10	High Tide	Falling	Cloudy	South-Southeast	Moderate (10-15 mph)	75	659	1.1	Routine
	6/1/2015	6:30	High Tide	Falling	Scattered Clouds	North-Northeast	Light (0-5 mph)		75	0.2	Routine
	6/8/2015	6:40	Low Tide		Partly Cloudy	South-Southeast	Light (0-5 mph)	79	42	0.8	Routine
	6/15/2015	6:30	High Tide	Falling	Cloudy	East-Southeast	Light (0-5 mph)	77	453	3.8	Routine
	6/22/2015	6:40	High Tide	Falling	Partly Cloudy	South-Southeast	Light (0-5 mph)	82	75	2.1	Field Split
	6/22/2015	6:40	High Tide	Falling	Partly Cloudy	South-Southeast	Light (0-5 mph)	82	53	2.1	Routine
	6/29/2015	6:35	High Tide	Falling	Partly Cloudy	West-Southwest	Light (0-5 mph)	80	42	1.8	Routine
	7/6/2015	6:30	High Tide	Falling	Partly Cloudy	South-Southeast	Moderate-Light (5-10 mph)	80	10	2.3	Routine
	7/13/2015	6:20	High Tide	Falling	Scattered Clouds	West-Southwest	Moderate-Light (5-10 mph)	82	10	4.2	Routine
	7/20/2015	6:30	Low Tide	Falling	Partly Cloudy	West-Southwest	Light (0-5 mph)	83	10	5.4	Routine
	7/27/2015	6:30	High Tide	Falling	Partly Cloudy	North	Light (0-5 mph)	84	42	8.3	Routine
	7/27/2015	6:30	High Tide	Falling	Partly Cloudy	North	Light (0-5 mph)	84	31	8.3	Field Split
	8/3/2015	6:30	Low Tide	Falling	Partly Cloudy	North-Northeast	Light (0-5 mph)	82	20	14.6	Routine
	8/10/2015	6:20	High Tide	Falling	Partly Cloudy	West	Moderate-Light (5-10 mph)	80	5	16.6	Routine
	8/17/2015	6:25	High Tide	Falling	Partly Cloudy	East-Northeast	Light (0-5 mph)	83	53	18.9	Routine
	8/24/2015	6:30	High Tide	Falling	Scattered Clouds	West	Light (0-5 mph)	84	5	15.7	Routine
	8/31/2015	6:10	High Tide	Falling	Partly Cloudy	North-Northeast	Light (0-5 mph)	82	53	16.9	Routine
	9/8/2015	7:05	High Tide	Falling	Scattered Clouds	Calm	Calm (0 mph)	83	560	16.8	Routine
	9/14/2015	7:20	High Tide	Falling	Clear	East-Northeast	Light (0-5 mph)	77	53	12.5	Routine
	9/21/2015	6:25	High Tide	Falling	Cloudy	East-Southeast	Light (0-5 mph)	80	10	14.8	Field Duplicate
	9/21/2015	6:25	High Tide	Falling	Cloudy	East-Southeast	Light (0-5 mph)	80	75	14.8	Routine
	9/28/2015	6:20	High Tide		Rain	South-Southeast	Moderate (10-15 mph)	80	885	16.5	Routine
	10/5/2015	6:30	High Tide	Falling	Clear	North-Northwest	Light (0-5 mph)	74	31	14.1	Routine
	10/12/2015	6:20	High Tide	Falling	Clear	South-Southeast	Moderate-Light (5-10 mph)	74	20	16.5	Routine
	10/19/2015	6:20	High Tide	Falling	Scattered Clouds	East-Southeast	Light (0-5 mph)	68	738	17.5	Routine
	10/26/2015	6:20	High Tide	Falling	Light Rain	North-Northwest	Moderate-Light (5-10 mph)	64	1298	19.2	Field Duplicate
	10/26/2015	6:20	High Tide	Falling	Light Rain	North-Northwest	Moderate-Light (5-10 mph)	64	945	19.2	Routine

APPENDIX D

Summary of Louisiana BEACH Program's Fulfillment of U.S. EPA's BEACH Grant Requirements

Summary of Louisiana BEACH Program's Fulfillment of USEPA's BEACH Grant Requirements

USEPA established nine performance criteria that eligible coastal or Great Lakes state, tribal, or local governments must meet to receive grants to implement coastal recreation water monitoring and public notification programs under the BEACH Act. Those criteria, together with a brief summary how Louisiana has fulfilled each, are provided below.

Category	Performance Criterion	Louisiana's Fulfillment of Criterion
Evaluation and Classification	1. Develop risk-based beach evaluation and classification plan	<p>Identification of factors used to evaluate and rank beaches are provided in Chapter 2 of the <i>Louisiana's BEACH Grant Final Report, Grant Year 2001</i> (the "Initial BEACH Report"; LDHH, 2003). More specifically:</p> <ul style="list-style-type: none"> • Coastal recreation waters are identified in Section 2.1. • Beaches used by the public for water contact activities within coastal recreation waters are identified in Section 2.2. • The original information describing (1) the potential risk to human health presented by pathogens and (2) the use of the beaches is provided in Sections 2.3-2.4 of the Initial Report. Information on the prior year's water quality and projected level of use for each beach monitored under the Program are provided in Chapter 2 of the Program's annual report. • EPA is notified annually of any change in beach rankings and other program changes in Chapter 2 of the Program's annual report.
	2. Develop tiered monitoring plan	<ul style="list-style-type: none"> • Chapter 3 of the Initial BEACH Report describes the Program's monitoring plan, addressing the frequency and location of monitoring, and assessment criteria. • Chapter 2 of the Initial BEACH Report describes periods of recreational use of the waters, and nature and extent of use during certain periods. • Sample stations were established based on spatial use patterns as described in Chapter 2 of the Initial BEACH Report, adjusted for the proximity to known point and nonpoint sources of pollution. • Section 3.1 of the Initial BEACH Report outlines the Program's quality control plan, which is described more completely in the Program's current Quality Assurance Project Plan (QAPP).
Monitoring	3. Monitoring report submission and delegation	The Program reports monitoring data to the public, EPA, and other agencies through timely annual submission of those data to EPA's STORET database. Additionally, the full dataset and summaries are provided in the Program's Annual Report.

	4. Methods and assessment procedures	Methods for detecting levels of pathogen indicators in coastal recreation areas are described in Section 3.3 of the Initial BEACH Report and the QAPP.
Public Notification and Prompt Risk Communication	5. Public notification and risk communication plan	Measures to notify the public, EPA and local governments when indicator bacteria levels exceed a water quality standard are provided in Chapter 4 of the Initial BEACH Report.
	6. Measures to notify EPA and local governments	Measures to notify local governments and EPA when water quality standards are exceeded are provided in Chapter 4 of the Initial BEACH Report. The Program submits notification data and actions taken to notify the public to EPA's PRAWN database annually.
	7. Measures to notify the public	Measures to notify the public when water quality standards are exceeded are provided in Chapter 4 of the Initial BEACH Report. Upon observing an exceedance of water quality criteria, the Program immediately issues a public notification or resamples for bacterial exceedance of a water quality standard in accordance with the QAPP. The notification is placed on the Program's website, disseminated to the media, and signs posted at each station are changed to indicate that an advisory is in effect.
	8. Notification report submission and delegation	<ul style="list-style-type: none"> • EPA and local governments are notified annually of any notification plan changes and any delegation of responsibilities in the Program's annual work plan. • The Program reports actions taken to notify the public when water quality standards are exceeded in its annual PRAWN submission and in the Program's annual report.
Public Evaluation	9. Public evaluation of program	The Initial Beach Report and all subsequent annual reports have been made available to the public for review and comment. The Program publishes a public notice informing the public of the availability of the annual report and the duration of the comment period, and the report is made available on the Program's website.